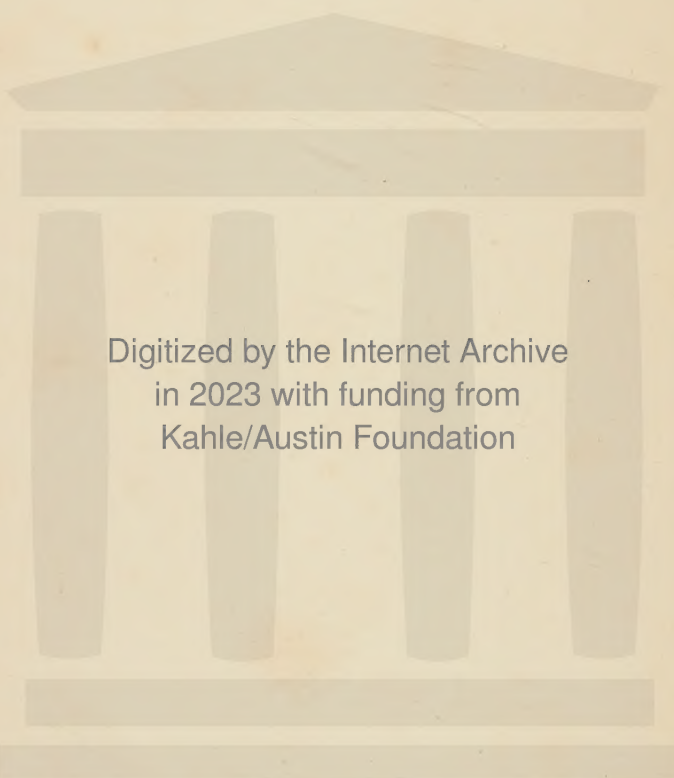


HISTORY
OF THE
GREAT WESTERN RAILWAY



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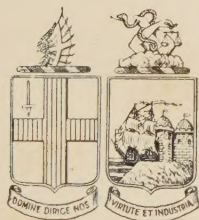
CHARLES RUSSELL
CHAIRMAN 1839-1855
("The Picture")

HISTORY OF THE GREAT WESTERN RAILWAY

BY
E. T. MACDERMOT, M.A.

VOL. I. 1833-1863

PART I



GREAT WESTERN RAILWAY COMPANY

[FELIX J. C. POLE, GENERAL MANAGER]

PADDINGTON STATION, LONDON

1927

FOREWORD

IN dealing with the troubles and difficulties which to-day beset most branches of industry and commerce, one sometimes derives consolation from the knowledge that similar situations were also the lot of our forebears, and the courage and perseverance which they showed in overcoming these difficulties are traditions which the history of the past enables us to learn and appreciate. Some hold the view that tradition and sentiment are of great value where the conduct of a large undertaking is concerned and I heartily endorse this opinion, but it is not every undertaking that is in the fortunate position of being able to claim an existence of long standing. This, however, is the proud possession of the Great Western Railway Company, whose original charter was obtained nearly a century ago, and when an opportunity recently arose of enlisting the services of a writer who has made almost a lifelong study of the history of the Company, it was felt that the story of its progress and achievements might justifiably be placed on permanent record and that, emanating from such a capable author, the volume would be a worthy addition to the standard works on English Railways.

The Directors of the Company accordingly agreed to give the Author, Mr. E. T. MacDermot, the facilities

which he required for completing his task, and the pages which follow faithfully record the struggles, the disappointments, and the triumphs which stand out as milestones in the Company's history—culminating in the radical changes brought about by the passing of the Railways Act, 1921, which led to the grouping of the Railways and to the extinction of the old Companies with the exception of the Great Western Company, which alone retained the privilege of using its own name in the amalgamations which followed.

To those who may derive pleasure from the reading of this book, and I hope they will be many, I would only add that, in my capacity as a Director of the Company since 1905 and as its present Chairman, it has been my good fortune to be in close and constant association with all those interested in the welfare of the Company and I regard it as a good augury for future prosperity that I see around me ample evidence of the desire of all grades to live up to the great traditions of a great Company.

Churchill.

AUTHOR'S PREFACE

THE story of the Great Western has always had an extraordinary fascination for me, and its study has been a hobby of mine for many years. Hence, though published with the sanction of the Company, this book is by no means an "official" history, as I am wholly unconnected with the railway world, but as it was desired to make the book an authentic history of the Company, I have used my best endeavours to ensure that nothing unsupported by authority is asserted.

I have to thank the Chairman and Directors for allowing me access to the records of the Company, and many Officers and members of the staff for invaluable assistance.

I am specially indebted to Sir Felix Pole for his encouragement; to the late Mr. E. L. Ahrons, who wrote the chapters on the early engines and carriages, of which subject he had an unrivalled knowledge, and to Mr. A. C. W. Lowe, who has kindly consented to complete this portion of the story; to Mr. G. F. Bird for the use of his authentic drawings of the old engines; to Mr. W. E. Edwards for information as to early signals; and last, but not least, to Mr. G. T. Milford, of Bristol, who did much heavy spade-work in connection with the history.

E. T. MACDERMOT.

August 1927.

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HISTORY OF THE GREAT WESTERN RAILWAY

CHAPTER I

BIRTH

London and Bristol Rail-Road 1825, J. L. McAdam—Bristol and London Railway 1832, W. Brunton and H. H. Price—Bristol Committee 1833—I. K. Brunel—London Committee—C. A. Saunders—Great Western Railway—Bill of 1834, Brompton to Reading and Bristol to Bath—Defeat—Raising the Money—Eton College—Basing and Bath Railway—Bill of 1835—Bristol to Euston—Box Tunnel—Victory.

THE first proposal of a railway to be worked by locomotives between London and Bristol, then the second town in the kingdom, was made in the autumn of 1824, nearly a year before the opening of the Stockton & Darlington Railway. It originated among some Bristol merchants and was adopted at a meeting held in the London Tavern on the 27th December, Thomas Wilson, M.P., in the Chair, when the formation of a company for the purpose, with a capital of £1,500,000 in £100 shares was resolved upon. "The London and Bristol Rail-Road Company" was accordingly formed, apparently without much difficulty. The Chairman was Richard Hart Davis, M.P., and among the Directors were John Fairlie, Sir Robert Farquhar, Sir John Lubbock, Hon. Leslie Melville, Donald Maclean, John Loudon McAdam, Sir Charles Price, and Sir John Reid. McAdam

was of course the famous road engineer, at that time Surveyor to the Bristol Turnpike Trust and many other similar bodies all over the country. Although a Director, he was employed as engineer to lay out the line, and in little more than a fortnight produced a plan for a railroad from Bristol via Mangotsfield, Wootton Bassett, the Vale of White Horse, and Wantage to Wallingford, whence it *might* be carried on along the right bank of the Thames by Reading, Wargrave, and Bray to Brentford, or on the other side by Ewelme, Turville, Wooburn, and Burnham to the same place. Either of these routes, he asserted, would be shorter than any road then in use between Bristol and London, and peculiarly favourable for a railroad on which the expense of locomotive power would be very reasonable, owing to so few elevations occurring. As he describes the Cotswold ridge as "a small swell of the country near Dodington," we can only assume that he took no levels. He recommended that a turnpike road should be made on the same line but "passing through the towns instead of near them, as the Railroad must necessarily do." Evidently the latter was intended only for the conveyance of goods, and there was no intention of bringing it nearer London than Brentford. At a meeting held, again at the London Tavern, on the 2nd February 1825, the Directors adopted his scheme and resolved to apply for an Act of Parliament for both the rail and turnpike roads but, though all the shares were stated to have been taken up, no such application was ever made, and the project died a very natural death. Other schemes of this same year that never came to anything were "The General Junction Railroad from London to Bristol," "The London and Reading Railroad," a "Proposed Railroad from

Bristol to Bath," "The Bristol Northern and Western Railway," and "The Taunton Grand Western Railroad." After this violent outbreak, the railway fever in the west seems to have completely subsided for seven years, during which only the two horse tramways to Coalpit Heath, respectively entitled the Bristol & Gloucestershire Railway and the Avon & Gloucestershire Railway, were inaugurated.

The success of the Liverpool & Manchester Railway, opened in September 1830, and of the Stockton & Darlington five years earlier, having become generally recognised, and lines having already been proposed and surveyed between Liverpool and Birmingham and London and Birmingham, the project of a railway between Bristol and London was again brought before the public in 1832.

Two engineers, William Brunton and Henry Habberley Price, were the first in the field with a practical proposal for a line by Bath, Bradford, Trowbridge, near Devizes, and through the Pewsey Vale to Hungerford, Newbury, and Reading, and on near Datchet and Colnbrook, by Southall "to a vacant spot within three or four hundred yards of Edgware Road, Oxford Street, and the Paddington and City-Road Turnpike. A short branch may unite this line with the intended Birmingham Railway, and thereby proceed towards the City as far as Battle-Bridge." This scheme was announced by a circular headed "Bristol and London Railway" dated from Lombard Street 7th May 1832, amplified by another in June, estimating the expense of the undertaking at £2,500,000 and showing that "an interest of 15 per cent. will be insured to subscribers." Although this project was still alive in January 1833, sufficient

financial support was not forthcoming, and we hear no more of Messrs. Brunton and Price.

Meantime the topic had been frequently discussed in commercial circles in Bristol and in the press without any definite result till one day in the autumn of 1832 four influential business men—George Jones, John Harford, Thomas Richard Guppy, and William Tothill—foregathered in a small office in a mean street called Temple Backs, long since swept away to make room for the Temple Meads Goods Depot, and resolved to press the matter forward. They forthwith proceeded to stir up their fellows with such success that before the end of the year a committee of prominent merchants and others, representing the five corporate bodies of Bristol, was appointed to investigate the practicability of a railway to London. These bodies and their deputies were the following:

Bristol Corporation—John Cave, Charles Ludlow Walker, and John Evans Lunnell.

Society of Merchant Venturers—George Gibbs, Peter Maze, and Henry George Fowler.

Bristol Dock Company—Humphry Jefferies, John Howell, and Nicholas Roch.

Bristol Chamber of Commerce—William Singer Jacques, Edward Harley, and William Tothill.

Bristol & Gloucestershire Railway—John Harford, George Jones, and Joseph Storrs Fry.

The Committee held its first meeting on the 21st January 1833, John Cave in the Chair and William Tothill acting as Secretary, when they considered the matter generally and advertised for information. In the course of the following month the Deputies reported favourably on the prospects of the undertaking to their

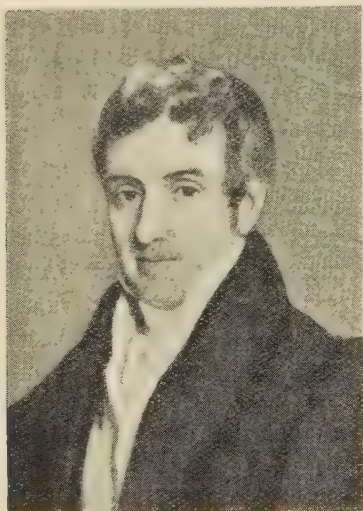
constituent public bodies, who thereupon provided funds for a preliminary survey and estimate, and Messrs. Harford, Jones, Roch, and Tothill were appointed a sub-committee to arrange for this, which of course involved the selection of an engineer.

There were several candidates for the post, among them a young man of twenty-seven, Isambard Kingdom Brunel, son of the Engineer of the Thames Tunnel and himself well known in Bristol as the author of the chosen design for the Clifton Suspension Bridge and engineer to the Dock Company for the improvement of the Floating Harbour. Though some of the other candidates had considerable local interest behind them, Brunel was appointed engineer on the 7th March, and at once set about surveying the country between Bristol and London in company with W. H. Townsend, a land surveyor and valuer.

Between Bath and Reading they first inspected the route by Bradford, Devizes, the Pewsey Vale, and Newbury, afterwards that north of Marlborough Downs, by Chippenham, Swindon, the Vale of White Horse, and the Thames Valley, and soon decided to recommend the latter. East of Maidenhead two or three lines of approach to the Metropolis were surveyed, one of them crossing the Thames by Kingston, and left for later decision. The expense of the undertaking was estimated at slightly over £2,800,000.

Their surveys and estimate having been completed and delivered to the Committee of Deputies, that body drew up an elaborate report on the whole subject, and a public meeting was held in the Guildhall, Bristol, on the 30th July 1833, presided over by Mr. Robert Bright in the absence of the Mayor. The Committee's report having

been read and discussed, it was resolved that "a Company should be formed for the establishment of Railway communication between Bristol and London, and for that purpose that a body of Directors for Bristol be appointed, who, in conjunction with a similar body to be appointed in London, shall constitute a General Board of Management for securing subscriptions and obtaining



GEORGE HENRY GIBBS

an Act of Parliament for effecting the same object." No less than thirty Bristol Directors, including all the Deputies, were accordingly elected, with power to add to their number; bankers were appointed to receive subscriptions; and votes of thanks passed to the five public bodies for setting the undertaking on foot, and especially to a Mr. Francis Fortune "for his unremitting endeavours to arouse the attention of the Citizens of Bristol to the

advantages to be derived from a railroad to London."

Meanwhile the Bristol merchants who had become interested in the project had been working up support among their friends and business acquaintances in London, with the result that by this time an influential Committee had been formed there, largely by the able co-operation of George Henry Gibbs, head of the firm of Antony Gibbs and Sons of London, and cousin of George Gibbs, one of the deputies of the Society of Merchant



ISAMBARD KINGDOM BRUNEL

(From the painting by J. C. Horsley, A.R.A., at Paddington)



CHARLES ALEXANDER SAUNDERS
(Age about 21)

Venturers on the original Bristol Committee, and senior partner of Gibbs, Bright and Co., of Bristol and Liverpool. This London Committee engaged as their Secretary a remarkable man, who was destined to do more towards founding the Great Western Railway system than any other single individual, Brunel himself not even excepted.

Charles Alexander Saunders was born in December 1796, the fifth son of Robert Saunders of Southend, Lewisham, Kent, and descended from a family long settled in Banffshire. After five years at a preparatory school he was admitted scholar of Winchester College in May 1810, where he was soon joined by his younger brother Augustus, afterwards head master of Charterhouse and Dean of Peterborough. Though Charles duly gained a provisional right to a scholarship at New College, he never went to Oxford, but left Winchester in February 1814 to accept an offer of a Government clerkship. At twenty-one he married Miss Mary Rowlandson, and after a few years resigned the Civil Service for mercantile pursuits, which took him for some time to Mauritius. Hence he had considerable experience of life and business when he became Secretary to the London Committee at the age of thirty-seven.

The first joint meeting of the London and Bristol Committees was held in the Counting House of Messrs. Antony Gibbs and Sons, 47 Lime Street, in the City of London, on the 19th August 1833. The title "Great Western Railway" was there and then adopted instead of "Bristol and London Railroad," by which the scheme had hitherto been known, and the first Prospectus of the Company settled.

This document was issued before the end of the

month under the new title. The capital is stated as £3,000,000 in shares of £100 each, deposit £5 per share. The Board of Directors consisted of two Committees of twelve each:

LONDON COMMITTEE.

John Bettington.
 Henry Cayley.
 Ralph Fenwick.
 George Henry Gibbs.
 Robert Fred. Gower.
 Riversdale W. Grenfell.
 Robert Hopkins.
 Edw. Wheler Miles.
 Benjamin Shaw.
 Henry Simonds.
 William Unwin Sims.
 George Wildes.

C. A. Saunders, *Secretary*.
 Office, No. 17 Cornhill.

BRISTOL COMMITTEE.

Robert Bright.
 John Cave.
 Charles Bowles Fripp.
 George Gibbs.
 Thos. Richard Guppy.
 John Harford.
 Wm. Singer Jacques.
 George Jones.
 James Lean.
 Peter Maze.
 Nicholas Roch.
 John Vining.

W. Tothill, *Secretary*.
 Railway Office, Bristol.

The cost of the line of about 120 miles is estimated at £2,805,330, and the prospective revenue at £747,752 per annum. A map shows the course of the railway much as it was afterwards made between Bristol and the neighbourhood of Taplow, whence alternative routes into London are shown, one direct into the west end, the other crossing the Thames below Kingston and terminating south of the river somewhere about Waterloo Bridge. The latter was soon abandoned and does not appear in the later prospectuses. Three "Probable Branches," from Didcot to Oxford, Swindon to Gloucester, and Chippenham to Bradford, also appear on the map.

Saunders was indefatigable in his efforts to place the Company on a firm footing. He travelled about the country enlisting support for the scheme, and succeeded in obtaining the views of many members of the House of Commons and several peers. But time was short and the public apathetic and distrustful. By the end of October scarcely a quarter of the capital had been subscribed,



MESSRS. GIBBS AND SONS' COUNTING HOUSE

whereas Parliament, by its standing orders, required at least half before the Bill could be proceeded with.

In consequence, the Directors issued a circular on the 23rd October, stating their intention—

“ . . . to make application in the approaching Session for authority to construct the sections of the main Railway extending between London and Reading (with a Branch to Windsor), and between Bristol and Bath, thereby rendering the ultimate completion of the whole line more certain, upon a further application to Parliament in the following year.

“ The number of shares required for this part of the undertaking will be 12,500, of which 2,500 will be reserved for the proprietors of land, etc., and consequently no application for

shares can be entertained so soon as 10,000 shall have been subscribed, of which a very considerable proportion has been already allotted."

All this time Brunel and a staff of assistants had been busy on a detailed survey of the whole line.

His own duty of superintendence severely taxed his great powers of work. He spent several weeks travelling from place to place by night, and riding about the country by day, directing his assistants and endeavouring, very frequently without success, to conciliate the landowners on whose property he proposed to trespass.

His diary of this date shows that when he halted at an inn for the night but little time was spent in rest, and that often he sat up writing letters and reports until it was almost time for his horse to come round to take him on the day's work. "Between ourselves," he wrote to Hammond, his assistant, "it is harder work than I like. I am rarely much under twenty hours a day at it."¹

The plans deposited at the end of November showed a line of railway which, except at the London end, did not vary much from the existing line. Starting at Vauxhall Bridge, it was to be carried by a viaduct about 20 feet high for four miles, through Pimlico, Brompton, and Hammersmith to South Acton, thence by a short tunnel to the south of Ealing on to West Drayton, Slough, Maidenhead, and Twyford, and through a tunnel under Sonning Hill to Reading. Between Bristol and Bath it was to have crossed the Avon four times instead of twice, as it does now.

The second reading of the Bill in the House of Commons was moved on the 10th March 1834 by Lord Granville Somerset, seconded by the Earl of Kerry and supported by several influential members, among them Daniel O'Connell, who saw in it "the means of conferring great advantages on Ireland, the great granary and feeding

¹ *Life of I. K. Brunel*, by I. Brunel, Longman, 1870, p. 65.

farm of this country.” After a debate of some hours, it was carried by 182 votes to 92, and the Bill referred to a Committee of which Lord Granville Somerset was Chairman. The Windsor Branch was dropped at an early stage owing to the violent opposition of Eton College.

The Committee met on the 16th April, and the proceedings occupied no less than fifty-seven days. Evidence to prove the public advantages of the railway was first taken. As far as passengers were concerned, these seem to have been generally acknowledged. Goods traffic between Bristol and London was then chiefly conducted by the Avon to Bath and thence by the Kennet and Avon Canal, opened in 1810, and the Kennet and Thames. The evidence showed that, apart from frost, which closed the canal, winter floods and summer droughts caused great delays on the rivers and even held up the traffic occasionally for weeks. The worst delays from both causes occurred on the Thames between Reading and London, and so bad were they that goods which came by the canal were frequently sent on to London by road, of course at a greatly increased expense. The distance by river was nearly eighty miles, more than double that by the proposed railway, and even under the most favourable conditions goods in barges took at least three days, whereas the railway would bring them in three hours. Between Bath and Bristol the barges took a whole day, which the railway would reduce to one hour. Farmers and stock breeders, other than those quite near London, also had a good deal to say in favour of the railway.

Brunel was of course the chief engineering witness. Having given his evidence, he was cross-examined for eleven days by seven learned counsel, to whom a modern child of ten could have given points in simple railway

knowledge. Questions of every conceivable kind, sensible and absurd, were asked him, many being suggested by a scientific theorist, Dr. Dionysius Lardner, whose solemn theories as to railways were as a rule proved to be quite erroneous, but who enjoyed an ephemeral reputation as a great authority at this time. Brunel answered them all readily and patiently, and George Stephenson and other engineers who were present are said to have been much struck by the ability and knowledge he displayed. Stephenson himself, Joseph Locke, James Walker, and H. R. Palmer gave evidence as engineers in favour of the line laid out by Brunel, Stephenson saying: "I can imagine a better line, but I do not know one so good." It was established that the line through the Thames Valley and north of Marlborough Downs was the best course for a railway from London to Bristol, as the levels were much better than any possible south of the Downs, and, moreover, it provided for communication with Oxford, Gloucester, and South Wales, which the latter route did not.

At an early stage of Brunel's examination the Committee called on the promoters to declare whether they would proceed with their line to Vauxhall Bridge or terminate it at Brompton; so in view of the determined opposition of the landowners, who were influential members of the House of Lords, it was decided to abandon the last two miles of the viaduct, and look for communication with the River and Docks, which was the object in view in choosing the Vauxhall terminus, by means of the Kensington Canal to the Thames at Chelsea. A space at the back of the still existing "Hoop and Toy" Public House in the Old Brompton Road was then selected for the site of the London terminus. This did not

please the Brompton owners and residents, who continued to oppose the line through their suburb with redoubled energy.

The chief opponents of the Bill were the landowners of Middlesex, Bucks, and Berks, including the Eton College authorities. At a meeting held by them in the previous November, the Provost of Eton said that no public good whatever could possibly come from such an undertaking, and he should be wanting in his duty to the establishment over which he presided if he did not oppose it to the utmost of his ability. These were only a part of the opposition. The inhabitants of Windsor opposed because the railway did not run as near their town as they wished; the Corporation of Maidenhead opposed because they feared the loss of tolls on their bridge over the Thames; the farmers near London opposed because produce from a distance would be brought to London to compete with their own; and the people interested in canals, rivers, and stage coaches opposed from fear of competition. Another kind of opposition came from the promoters of the London & Southampton Railway, who were seeking their own Act of Incorporation in this session, and went out of their way to attack the Great Western Bill, alleging that Bristol and the West of England could be equally well served by a branch from their line. This was the beginning of a long and bitter hostility to their great neighbour. There was also an insignificant rival project calling itself "The London and Windsor Railway" in the field, the promoters of which did their little best against the Great Western Bill, although they had withdrawn their own as soon as the latter had passed its second reading.

All these opponents having had their say, the Com-

mittee at length, on the fifty-seventh day of hearing, declared their approval of the Bill, and it passed the House of Commons. The Lords, however, made short work of it. The second reading was moved in that august assembly by Lord Wharncliffe, and forthwith rejected by 47 to 30, so the truncated scheme of 1834, which was described by an opposing Counsel as neither "Great" nor "Western," nor even a "Railway," perished. The fifty-seven days before the Commons Committee were not, however, entirely wasted, as we shall see next year.

The Directors were not greatly dismayed by this defeat; they recognised that, owing to the time spent in the Commons, it was too late in the session to hope to get the Bill through the Upper House. Nothing daunted, they began preparations for bringing in a new Bill for the whole line next year, feeling that they now had public opinion behind them, and were sure of success provided only they could raise the necessary capital.

In September a Supplementary Prospectus, signed by the two Secretaries, was issued, inviting subscriptions for 10,000 additional shares, which, they said, with the 10,000 already subscribed, would enable the Directors to carry a Bill for the whole line through Parliament in the next session. After describing and drawing encouragement from the proceedings in Parliament, this document goes on as follows:

The proposed line will pass through or near to Slough, Maidenhead, Reading, Wantage, Swindon, Wootton Bassett, Chippenham, and Bath, and thus intersect the South of England from East to West in the manner of a main Trunk, calculated to send branches to each district, North or South.

This line has been preferred on account of the superiority of its levels, and the ultimate economy of working steam power upon

it, as well as of its offering the greatest facilities for a junction with Oxford, Cheltenham, and Gloucester, the manufacturing districts of Gloucestershire and Wiltshire, and through Gloucester with South Wales.

A branch of only twelve miles over a level country may connect the main line with Oxford, and a branch of nine miles in length from the neighbourhood of Chippenham, passing by Melksham, may communicate with Bradford and Trowbridge, and confer on those important agricultural districts and manufacturing towns the benefits of the entire line, while the main Railway, as far as Swindon (a distance of seventy-six miles from London) will form the direct line to Gloucester, leaving only twenty-eight miles to be hereafter added to complete a Railway communication between that City and London, reducing the total distance to 104 miles.

As reference to the map might lead to the inquiry why a line by way of Hungerford, Devizes and Bradford was not chosen, it is right to state that a survey of that district was in the first instance made; but the difficulties and expence of such a Railway, owing to the altitude of the general levels of the country, were found to be so considerable that, even without reference to the reasons already adduced, the Directors cannot hesitate to prefer the northern line, which will scarcely exceed the other in length, and which, embracing Oxford, the clothing districts of Gloucestershire, the important towns of Stroud, Cheltenham and Gloucester; and thence leading eventually to Wales, may also be made to communicate, by a short branch as before stated, with Bradford, Trowbridge and other manufacturing towns on the southern line.

The expense of travelling and of carriage of goods by Railway will not exceed half the present charge; and the time occupied in passing from the Metropolis to Bristol will be about four hours and a half.

The sum required for the construction of the entire line of 116 miles, including Depots, Locomotive Engines, etc., will be £2,500,000. The difference between this and the original estimate of £2,805,330 arises in a great degree from a change in the direction of the line in the neighbourhood of London, but principally from the Engineer having now sufficient data to calculate the cost with accuracy; in the absence of which data on the former occasion, the Directors preferred stating a sum which should exceed rather than fall short of the greatest probable cost.

Though the length of the whole line is precisely stated as 116 miles, one less than in October and four less than

in August 1833, and a change of direction near London is alluded to, the eastern terminus is not specified, and so presumably had not been definitely fixed at this date. Negotiations with the London & Birmingham Company for a junction with their authorised line near Wormwood Scrubs were in progress. This having been arranged, a new edition of the Prospectus was issued in November, stating:

The Line of Railway is described in the annexed Plan. It will be 114 miles in length from Bristol to the point of junction with the Birmingham Line near Wormwood Scrubs. The station for Passengers in London is intended to be near the New Road in the Parish of St. Pancras.

Thus was Euston Station indicated in 1834. A large portion of the new Prospectus was taken up by a very full "Extract of Report of the Liverpool and Manchester Railway," showing in detail the receipts and expenses of that line and the alluring profits made. The Plan shows the main line exactly as in that of August 1833, except at the London end, and between Keynsham and Bristol, where two crossings of the Avon near Hanham are saved by the railway keeping to the Somerset bank. The "Probable Branches" are also identical, except that to Bradford, which now throws off a fork to Trowbridge.

All through the autumn and winter of 1834-5 the promoters were busy stirring up support, financial and moral, all over the West of England and in South Wales. The towns to be served by the railway were very emphatic in their expressions of disapproval of the action of the Lords in rejecting the Bill. Public meetings for the purpose were held in many of them, including a big meeting in the Merchants' Hall, Bristol, in October, attended by several Members of Parliament, and people

from London, Windsor, Reading, Gloucester, Stroud, Bath, Exeter, and other places. Later, meetings in support of the new Bill were organised in almost every town of any importance in the west, and petitions to Parliament extensively signed even in places as remote as Truro, Bridport, Hereford, and the County of Tipperary. Saunders and Brunel were the leaders in this campaign, but they had many helpers; even some of the Directors travelled the country.

The following letter from Saunders to Thomas Merri-man Ward, his chief and for a time sole assistant at the London Office, 17 Cornhill, gives a good idea of the work.

3 COLLONADE

CHELTENHAM. 14 Dec. 1834

MY DEAR SIR,

I find it impossible for me to be in London this week, having several appointments in this part of the Country which require attention. We had an excellent meeting at Cirencester on Friday, Mr. Cripps in the Chair. Lord Ed^d Somerset the other M.P. was present. The resolutions were passed unanimously and we had 90 shares taken at once. A Committee is formed for procuring Subscriptions, and we shall do very well in that Town. Here we are getting several Subscribers of 50 Shares each. Our days are wholly employed in canvassing and we have every reason to be pleased with our success. We are anxious however to say little or nothing about our doings, lest they should attract our opponents to disseminate in this quarter any false statements, etc. We certainly gain more by a quiet process, withdrawing from the observation of our Foes, and above all boasting as little as possible of success. I mention this as a caution to any of our own immediate Friends or Directors who may be enquiring from you.

We hope and believe that we have the means of getting up 3,000 Shares in Ireland, South Wales, Gloucestershire, etc., before the 20 January. At Bristol by great exertions 5,000 Shares in addition will be sold, and we must hope in London among old Proprietors, Friends, etc., to get rid of 2,000 Shares to complete the whole Affair.

We have a private meeting on Tuesday with 20 of the chief

Merchants at Gloucester to form there a provisional Committee. Our public meeting is for the 2^d January. We shall be employed in Gloucester, Cheltenham, Stroud and Cirencester until that day. I must also go over to Dursley and Wootton-under-Edge, and probably to Chippenham.

After the 2^d January I expect Mr. Maze and Mr. Bright to accompany me for a week or 10 days into S^o Wales. Mr. Hunt will work towards London at the same time—through Wallingford, Abingdon, Oxford, etc.

Continue to address me at Cheltenham for the present.

Ever yours truly,

CHAS. A. SAUNDERS.

The 1st February 1835 finds him again at Cheltenham, at last confident of success. He writes to Ward:

I leave this at 6 tomorrow for South Wales, where I shall be until this day week. My intention then is to leave Cheltenham on the evening of Monday the 9th, wait at Oxford to see what can be done there until Wednesday the 11th, upon which day I should return home. I hope you are preparing the Lists of Proprietors to be deposited in Parliament. This will be necessary, and I expect to have so much on hand when I return home in the form of Circulars, Letters, Accounts, Deeds to be executed, etc., that I wish to clear up such business beforehand.

This last week has produced about 450 Shares, and I feel now quite sure that we shall effectually complete our List of Subscription in time for Parliament.

It is however sad harassing work that I have encountered in calling upon and pressing perfect strangers to contribute. "All's well that ends well."

Out of such "sad harassing work" of himself and others was the Great Western Railway born. His confidence was justified. Before the end of the month he and Tothill were able to announce to the public that the whole of the 10,000 additional shares required by Parliament for the entire railway from London to Bristol had been taken, making, with the previous 10,000, a capital of two million pounds, and that the Petition for the Bill had been presented to the House of Commons.

The foes to whom he alludes in his December letter were the promoters of an abortive scheme for a line from Tring to Cheltenham, and the London & Southampton Railway Company, who, having obtained their Act, instead of proceeding quietly with their own business, at once began an active aggression on the Great Western by promoting a rival line from Basingstoke to Bath and Bristol, laid out by their engineer, Francis Giles, through Newbury, Hungerford, Devizes, Trowbridge, and Bradford. They met with some support from these townlets, but little or none from Bath and Bristol. At a meeting organised by them at Bath in September, after flowery addresses from several members of their deputation, Brunel got up and demolished their arguments, with the result that a resolution in favour of the Great Western was carried with acclamation, and the deputation retired discomfited. Notwithstanding this and other rebuffs, the Southampton Company proceeded with their Bill for the Basing, Bath and Bristol Railway, and in order to spike some of their guns, the Great Western added a forked branch from Chippenham to Bradford and Trowbridge to their own Bill.

This was read a second time without opposition in the Commons on the 9th March 1835, again on the motion of Lord Granville Somerset, and committed, the Report of last year's proceedings being referred to the Committee.

The chief opponents were now the London & Southampton Company and the Eton schoolmasters, the land-owners generally having either been conciliated or given up hope of defeating the railway.

Soon after the Committee had met, its Chairman, Charles Russell, member for Reading, announced that, inasmuch as the public advantages of a railway to Bristol

were sufficiently established by last year's Report, referred to them by the House, they required no further evidence on that subject, and desired Counsel to confine the case to the merits of the line proposed. This decision, of course, took most of the wind out of the opponents' sails, and obliged them to try to show the superiority of their Basing and Bath Railway—a hopeless task.

The attack was mainly concentrated on the “monstrous and extraordinary, most dangerous and impracticable” tunnel at Box, with its incline of 1 in 100. One opposing witness, calling himself an engineer, asserted his belief that the inevitable consequence of constructing such a tunnel would be the wholesale destruction of human life, and that no care, no foresight, no means that he was acquainted with could prevent it; another that “no person would desire to be shut out from the daylight with a consciousness that he had a superincumbent weight of earth sufficient to crush him in case of accident”; and a third that “the noise of two trains passing in the tunnel would shake the nerves of this assembly. I do not know such a noise. No passenger would be induced to go twice”! This sort of nonsense does not seem to have had much effect on the Committee, and the objections to the incline were defeated by the production of a report by George Stephenson and H. R. Palmer that Brunel had consulted them as to his two proposals, one of a long incline at 1 in 330 and the other of a shorter one of 1 in 100 confined to the tunnel, and that they agreed with him in preferring the latter, “as by concentrating the rise at one point within a practicable length for working either by a stationary or assistant engine he reduced all the remaining inclinations on the line to the present favourable amount.” They antici-

pated no difficulties in the execution of the work, and added: "The levels of the proposed line are undoubtedly superior to those of the Southampton or the Basing and Bath, or any of the extensive lines with which we have an acquaintance, and are therefore better adapted to the working of the locomotive engine both as regards economy and expedition."

The opponents were obliged to admit that the gradients of the Basing and Bath were generally steeper than those of the Great Western, but maintained that they were so balanced that the rises and falls compensated one for another so as to render the line practically level; whereupon the Chairman remarked that on this principle the Highlands of Scotland would be as good as any other district for the construction of a railway.

The Committee eventually decided in favour of the Great Western Bill, and reported it to the House, where it was read a third time on the 26th May, after a proposal by an earnest sabbatarian that no engine or carriage should be moved on the Lord's Day under a penalty of £20 had been defeated by 212 to 34.

Next day it was introduced in the Lords and read a first time, numerous petitions in its favour being presented by various peers. The second reading was carried by 46 to 34 on the 10th June, and the Bill referred to a Committee presided over by Lord Wharnccliffe. Although this Committee soon came to the same decision as the Commons that no more evidence of the need for a railway to Bristol was called for, the fight before them raged for forty days. Box Tunnel was again the chief point of attack, and our old friend, Dr. Dionysius Lardner, the chief witness of its impracticability and danger. That great pundit soon gave himself away rather badly by

producing some elaborate calculations, which proved conclusively—to his own satisfaction, at any rate—that if the brakes were to fail a train would run down the incline in the tunnel with a constantly increasing velocity, till it at last emerged at a speed of 120 miles an hour. Unfortunately for the philosopher's reputation, Brunel at once showed that he had entirely omitted the restraining forces of friction and air resistance from his calculations, and that these would have the effect of reducing his 120 miles an hour to 56. The assertions of the opposition party had already been considerably discounted by the Chairman having, during Brunel's cross-examination, drawn the attention of the Committee to a printed statement circulated by them just before the second reading of the Bill, which the actual evidence given showed to contain several gross falsehoods, as their Counsel was compelled to admit.

George Stephenson, Joseph Locke, and Messrs. Palmer, Price, and Vignoles, called as engineers by the promoters, expressed their unqualified approbation of the line chosen by Brunel and of his estimates. On the other side, William Brunton, the pioneer of 1832, may be noted.

At last, towards the end of August, the Committee declared the preamble proved by 33 to 21, and having inserted some clauses proposed by the Eton lawyers for the protection of the morals and discipline of that famous school, which several masters said would be inevitably ruined by the proximity of a railway, reported the Bill for third reading. This was opposed by His Royal Highness the Duke of Cumberland, soon to be King of Hanover, and twenty-seven other peers, but carried by a majority of twenty-two, and the Bill received the Royal Assent on the 31st August 1835.

Thus was the Great Western Railway Company at last incorporated, and empowered to make a railway “commencing at or near a certain Field called Temple Mead within the Parish of Temple otherwise Holy Cross in the City and County of the City of Bristol, adjoining or near to the new Cattle Market there,” passing through specified parishes in the Counties of Gloucester, Somerset, Wilts, Berks, Oxford, Bucks, and Middlesex, “and terminating by a Junction with the London and Birmingham Railway in a certain Field lying between the Paddington Canal and the Turnpike Road leading from London to Harrow on the western side of the General Cemetery in the Parish or Township of Hammersmith in the said County of Middlesex ” ; and also a branch railway from near Thingley Farm, in the parish of Corsham, to a field near the Gas Works in the part of the parish of Trowbridge called Islington, with another branch there-out from the south-western extremity of the village of Holt in the parish of Bradford, to the farmyard of Kingston Farm adjoining the town of Bradford. It is interesting to notice incidentally that part of Twyford, east of Reading, was then in the County of Wilts.

The Act contains two hundred and fifty-one sections, many of them for the protection of individual land-owners, Canal Companies, and Turnpike Trusts. No diversion, branch, or station was to be made within three miles of Eton College, and besides “a good and sufficient fence on each side” of four miles of the line, the Company were to maintain “a sufficient additional number of persons for the purpose of preventing or restricting all access to the said Railway by the Scholars of Eton College aforesaid whether on the Foundation or otherwise,” such persons to be under the orders of the Provost

and Head Master. Compensation was to be paid to the Corporation of Maidenhead for any annual decrease in their Bridge tolls for six years after the opening of the railway; and to prevent loss of the Coal Duty payable to the City of London, a stone was to be placed on the East Bank of the River Colne, in the Parish of Hillingdon, and 1s. 1*d.* paid to the City on every ton of coal, culm, or cinders brought by railway towards London past such stone, 500 tons yearly for the use of the Company's engines only being allowed free of duty. Similar "City Stones" already existed on the Thames at Staines Bridge and on the Grand Junction Canal at the north-east corner of Grove Park, Hertfordshire.

The First General Meeting of the new Company, held at the City of London Tavern on the 29th October 1835, Benjamin Shaw in the Chair, was one of general congratulation and thanksgiving. Cordial votes of thanks were passed to Lord Wharncliffe, Lord Granville Somerset, and Charles Russell, M.P., for their invaluable help in Parliament, to the Directors, Brunel, the Solicitors, and St. George Burke, the Parliamentary Agent, and especially to Secretary C. A. Saunders, to whom the Proprietors requested the Directors to present a gratuity in addition to his salary, "entertaining a very high sense of his services and being desirous that some testimony of their esteem and approbation should be given him."

The Directors reported that they proposed to push on at once with the sections of the railway between London and Maidenhead and Bristol and Bath; that they were negotiating with the London & Birmingham Board for the use of their line into London; and that they had secured premises in Prince's Street, near the Bank, "with a large frontage to which all Public Conveyances

will have access, constituting at once the General Office for the ordinary affairs of the Company, and the Receiving Station for passengers and light goods proceeding to and from the Railway." Apparently the idea was that passengers would be booked in Prince's Street, and conveyed by coaches or omnibuses thence to the trains at Euston; but why people from the railway should be "received" in the City is not so clear.

The accounts show that £88,710 had been spent, the greater part of it in Parliamentary expenses.

Twenty-four Directors to replace the thirty named in the Act were elected at this meeting, half of them forming the London and half the Bristol Committee, each of which had considerable powers of action independently of the other. This first Board of the Company consisted of the following:

LONDON COMMITTEE.

Benjamin Shaw, *Chairman*.
 Ralph Fenwick.
 George Henry Gibbs.
 Robert Frederick Gower.
 Riversdale William Grenfell.
 Robert Hopkins.
 Edward Wheler Mills.
 Henry Simonds.
 William Unwin Sims.
 William Tite.
 George Wildes.
 John Woolley.

BRISTOL COMMITTEE.

Robert Bright, *Deputy*
 Henry Bush. [*Chairman*.
 Charles Bowles Fripp.
 Thomas Richard Guppy.
 William Singer Jacques.
 George Jones.
 Peter Maze.
 Thomas Pycroft.
 Nicholas Roch.
 Robert Scott.
 William Tothill.
 John Vining.

Captain T. J. Chapman succeeded Tothill as Bristol Secretary.

CHAPTER II

CONSTRUCTION

Gauge of Seven Feet decided on—Deviation Acts of 1836-7—Extension to Paddington—Railways to Exeter and Cheltenham—Construction London to Maidenhead—Wharncliffe Viaduct—Uxbridge Road Bridge—Paddington Station—Permanent Way—Daniel Gooch—First Engines—Opening to Maidenhead—Eton College and Slough Station—Disappointment and Opposition.

IMMEDIATELY after the incorporation of the Great Western Railway Company, Brunel broached a subject to the Directors which was destined to have a momentous effect on its fortunes, and directly or indirectly on many other railways in England and elsewhere. This was the question of the most suitable width between the two rails, or, as it was called, the gauge of the railway.

The width of the old wooden tramways of the Northumberland collieries had originally been fixed by the distance between the wheels of the ordinary carts of the district, and when iron rails were adopted they were of course laid on the existing timbers. The space between the rails of these early railways varied slightly in the different collieries, but was generally somewhat less than five feet. At Killingworth, where George Stephenson was employed and where he made his first locomotive engine, the distance between the insides of the rails happened to be 4 feet 8 inches; so, when he was engaged to lay out the Stockton & Darlington Railway, he

naturally adopted that gauge, especially as some of the waggons used in forming the earthworks came from a neighbouring tramway of the same width. Thus the first public railway was made with a gauge of 4 feet 8 inches, not from any deliberate choice or intrinsic advantage of this dimension, but merely because it chanced to be already established at some of the adjacent collieries. Perhaps it corresponded with an even five feet between the outer edges of the rails then in use.

The die was finally cast when Stephenson, apparently without any very deep consideration of the subject, adopted this same gauge for the infinitely more important Liverpool & Manchester Railway on the other side of England. An extra half-inch between the rails was added by some person unknown to fame about this time. His son Robert, asked by the Gauge Commissioners whether George Stephenson had proposed 4 feet $8\frac{1}{2}$ inches for the Liverpool & Manchester, said: "No. It was not proposed by my Father. It was the original gauge of the railways about Newcastle-on-Tyne, and *therefore* he adopted that gauge." This explanation is far from satisfactory. There is no apparent reason why the gauge of these insignificant little private coal lines should decide or even influence that of an important public railway between two of the largest towns in England far away from Newcastle.

The Grand Junction Railway, from Warrington to Birmingham, necessarily adopted the gauge of the Liverpool & Manchester, which it joined, and this in its turn decided that of the London & Birmingham. Thus the 4 feet $8\frac{1}{2}$ inches gauge was established on the lines between Liverpool and Manchester and London, and as a necessary consequence on all the railways made or authorised to

connect with any of them. It was also adopted for the London & Greenwich Railway, incorporated in 1833, and consequently for other lines south of London made later to connect therewith. In fact, it had already become the recognised gauge for all English railways, and was generally specified in the Acts of Parliament authorising their construction.

Such was the state of the matter when Brunel was making his surveys for the Great Western line in 1833 and 1834. In the course of these, being endowed with a vivid imagination and distinctly original turn of mind, he became impressed with the great possibilities of the extraordinarily straight and level road he was laying out, and hence with the desirability of getting rid of the limitations imposed by rails less than five feet apart. In his own words to the Gauge Commissioners:

“ Looking to the speeds which I contemplated would be adopted on railways and the masses to be moved, it seemed to me that the whole machine was too small for the work to be done, and that it required that the parts should be on a scale more commensurate with the mass and the velocity to be attained.

“ I think the impression grew upon me gradually, so that it is difficult to fix the time when I first thought a wide gauge desirable; but I daresay there were stages between wishing that it could be so and determining to try and do it.”

Beyond discussing the subject casually with Saunders and one or two of the Directors, Brunel made no move till early in 1835, when he successfully persuaded Lord Shaftesbury, Chairman of Committees in the House of Lords, to allow the usual clause defining the gauge to be omitted from the Great Western Bill, on the ground that a wider gauge might be a great public advantage. As a precedent for the omission, he was able, curiously enough, to cite the London & Southampton Bill of the previous

year, which had been passed without it, probably by an oversight. On the other hand, the Great Western Bill of 1834 is said¹ to have contained the clause, so that if that Bill had not been defeated, the wide gauge might never have been heard of.

Even at this time he had not definitely decided on the width to recommend, and it was not till after the passing of the Act that he first suggested seven feet in the following report :

53 PARLIAMENT STREET
15th September, 1835.

To the Directors of the Great Western Railway Company.

GENTLEMEN,

I beg to submit the following observations upon the subject of the width of the rails as explanatory of the grounds upon which I have recommended to you a deviation from the dimensions adopted in the railways hitherto constructed.

The leading feature which distinguishes railways from common roads is the great diminution of that resistance which arises from the friction at the axle trees, and more particularly from obstruction on the road ; this latter is almost entirely removed in a well kept surface of a railway, and friction may be considered as the only constant resistance.

The effect of gravity when the load has to ascend any inclination is, of course, the same whatever the nature of the road, and depends only upon the rate of inclination.

In the present state of railways and railway carriages the constant resistance, which we will call friction, amounts generally to about $1/250$ or 9 lbs. per ton, although under favourable circumstances it may be reduced to $1/280$ or 8 lbs. per ton. Assuming the latter as being the least favourable to the view which I purpose to take of the necessity of further improvement, I will apply this to the case of the Great Western Railway.

Upon the Great Western Railway from Bristol to Bath and from London to the Oxford branch, a total distance of about 70 miles, including those portions upon which two full thirds of the traffic will take place, there will be no inclination exceeding 4 feet per mile, which will cause a resistance of only 1 lb. and

¹ No copy of this Bill seems to have survived.

seven-tenths per ton, calling it even two lbs., while the friction is taken at 8 lbs. it appears that the latter will constitute 80 per cent. of the whole resistance. The importance of any improvement upon that which forms so large a proportion is obvious, but nevertheless, according to the present construction of railways, a limit has been put to this improvement, which limit is already reached, or at all events, great impediments are thrown in the way of any material diminution of the friction, and this serious evil is produced indirectly by the width of the railways.

The resistance from friction is diminished as the proportion of the diameter of the wheel to that of the axle-tree is increased; there are some causes which in practice slightly influence this result, but within the limits of increase which could be required we may consider that practically the resistance from friction will be diminished exactly in the same ratio that the diameter of the wheel is increased; we have here, therefore, the means of materially diminishing this resistance.

The wheels upon railways were originally much smaller than they are now. As the speed has been increased and economy in power become more important, the diameters have been progressively increased and are now nearly double the size they were but a few years ago—even upon the Liverpool and Manchester Railway I believe they have been increased nearly one-half, but by the present construction of the carriages they have reached their limit.

The width of the railway being only 4 feet 8 inches between the rails, or about 4 feet 6 inches between the wheels, the body of the carriage, or the platform upon which the luggage is placed, is, of necessity, extended over the tops of the wheels, and a space must also be left for the action of the springs; the carriage and load is raised unnecessarily high, while at the same time the size of the wheel is inconveniently limited.

If the centre of the gravity of the load could be lowered the motion would be more steady, and one of the causes of wear and tear both in rails and carriages would be diminished.

By simply widening the rails so that the body of the carriage might be kept entirely within the wheels the centre of gravity might be considerably lowered and at the same time the diameter of the wheels be unlimited.

I should propose 6 feet 10 inches to 7 feet as the width of the rails which would, I think, admit of sufficient width of carriages for all purposes. I am not by any means prepared at present to recommend any particular size of wheel or even any great increase of the present dimensions. I believe they will be materially increased, but my great object would be in every possible way to render each part capable of improvement, and to remove what

appears to be an obstacle to any great progress in such a very important point as the diameter of the wheels, upon which the resistance, which governs the cost of transport and the speed that may be obtained, so materially depends.

The objections which may be urged against these alterations are :

- (1) The increased widths required in the cuttings, embankments and tunnels and consequently the increased expenses ;
- (2) A greater amount of friction in the curves ;
- (3) The additional weight of the carriages ;
- (4) The inconvenience arising from the junction with the London and Birmingham Railway.

1st. As regards the increase of the earthwork, bridges and tunnels. This would not be so great as would at first sight appear ; the increased width of each railway does not affect the width between the rails or on either side as the total widths of the bodies of the carriages remain the same, and as the slopes of the cuttings and embankments are the same, the total quantity would not necessarily be increased above one twelfth and the cost of the bridges and tunnels would be augmented about in the same ratio, and such addition has been provided for in the estimates.

2nd. The effect of the friction upon small curves. The necessary radius of curvature will be increased in the ratio of the widths between the wheels, viz., as 5 to 7, but the portions of the total length which is curved to such a degree as to render this effect sensible is so small (not being above $1\frac{1}{2}$ miles upon the whole line except immediately at the entrance of the depots) that it is not worth considering when a great advantage is to be gained upon a total distance of 120 miles.

3rd. The additional weight of the Carriages. The axle-trees alone will be increased and these form but a small part of the Carriage. The frame will indeed be simplified and I believe this will fully counterbalance the increased lengths of the axle-trees. If the wheels are materially increased in diameter they must of course be stronger and consequently heavier, but this weight does not affect the friction at the axle-trees and not sensibly the resistance to traction, while their increased diameter affords the advantages which are sought for.

4th. The inconvenience in effecting the junction with the London and Birmingham Railway.

This I consider to be the only real obstacle to the adoption of the plan ; one additional rail to each railway must be laid down. I do not foresee any great difficulty in doing this, but undoubtedly the London and Birmingham Railway Company may object to it,

and in that case I see no remedy, the plan must be abandoned. It is therefore important that this point should be speedily determined.

I am, Gentlemen,

Your obedient servant,

I. K. BRUNEL.

The obstacle which Brunel feared might be fatal to the adoption of his plan was removed before the end of the year by the abandonment of the intended junction with the London & Birmingham Railway and the decision of the Great Western Board to seek an independent entry into London. According to the latter's statements, this was brought about, not, as has often been asserted, by the adoption of the wide gauge, but by the refusal of the London & Birmingham Directors to part for any reasonable and definite period with the land necessary for Great Western stations and depots at Camden and Euston. The official story of the negotiations is told at length in the Great Western Report to the First Half-yearly Meeting in February 1836. The Directors first stipulated for an absolute purchase or at least a building lease, and on these being refused went so far as to offer to accept a lease for twenty-one years. Even this was refused. All the Birmingham Board would do was to grant the land subject to resumption by them at any time on five years' notice; an offer "which your Directors had no hesitation in declining, under the conviction that the permanency of the junction would be thereby defeated, entertaining also a confident belief that an excellent and independent terminus can be secured without much difficulty at latest in the next Session of Parliament." This was in December 1835, just too late for the deposit of a Bill for the ensuing Session of 1836. On the other hand, Robert Stephenson, giving evidence before the Select

Committee on Railways of 1839, said that if the same width of gauge had been adopted any other difficulties could have been arranged, and complained that his Company had been left with more land at Euston than they could use, bought to accommodate the Great Western. Saunders, on his part, told the same Committee that the causes were the conditions of tenure, the gauge, the danger of the junction, and the anticipated greater speed of the Great Western trains and difficulty of arranging their times; adding that "the London and Birmingham were glad to get rid of us."

After much consideration, Brunel's suggestion was accepted by a large majority of the Board, and the gauge of seven feet sanctioned on the 29th October 1835. The fact soon became known, but was not officially published till August 1836, when their Report to the Half-yearly Meeting at Bristol, after alluding to the very favourable gradients of the now finally set out line "unequalled upon any Railway of great extent now in progress" and the higher speeds that might consequently be obtained, proceeded:

Under these peculiar circumstances and with a view to obtaining the full advantage of the regularity and of the reduction of power effected by this near approach to a level, and also to remedy several serious inconveniences experienced in existing Railways, an increased width of Rails has been recommended by your Engineer, and after mature consideration has been determined upon by the Directors.

Difficulties and objections were at first supposed by some persons to exist in the construction of Engines for this increased width of Rails, but the Directors have pleasure in stating that several of the most experienced and eminent manufacturers of Locomotive Engines in the North, have undertaken to construct them—and that several Engines are now actually contracted for, adapted to the peculiar dimensions and levels of this Railway calculated for a minimum velocity of 30 miles per hour.

These Engines will be capable of attaining a rate of 35 to 40

miles per hour with the same facility as the speed of 25 to 30 miles is gained by those now constructed for other lines.

Acts authorising several deviations of the original line were obtained without opposition in 1836 and 1837, whereby among other things two long tunnels in Berkshire, one of five-eighths of a mile under Holme Park in the parish of Sonning and the other of one mile at Purley, were avoided; an open cutting, the deepest on the line, a little further south, being substituted for the former with the consent of the landowner, Mr. Palmer, M.P. for Berkshire, who had been an active and influential opponent of the railway.

Another Act of the latter year sanctioned the extension of the line from Acton to "a certain space of ground adjoining the Basin of the Paddington Canal in the Parish of Paddington."

Very soon after the breaking off of the negotiations with the London & Birmingham Company the Directors had decided on this extension, and in August 1836 were able to announce to the Proprietors that they had secured the general consent of the owners and occupiers to a line into Paddington, and ample space for the station there. The length of the new line from Acton would be about $4\frac{1}{2}$ miles, but allowing for the abandoned piece to the junction at Kensal Green, there would be only an additional $2\frac{1}{2}$ miles to construct. In order that the opening of the railway to Maidenhead, promised by Brunel for October 1837, might not be delayed, work was at once begun on the lands of the consenting owners without waiting for Parliamentary sanction, but of course no public roads could be interfered with. One result of the impossibility of getting the Act in 1836 was that the Birmingham, Bristol & Thames Junction, known later

as the West London, Railway Company was authorised in that year to make a railway from the London & Birmingham near Willesden to the Kensington Canal, cutting right across the line of the intended Great Western extension on the same level. However, that little Company was afterwards induced to surrender its prior rights and agree that the Great Western trains should have precedence over the crossing.

To complete the Parliamentary story of this early period, it must be noted that the Bristol & Exeter and Cheltenham & Great Western Union Companies obtained their Acts in 1836, the latter for a railway joining the Great Western at Swindon. This had been opposed by the London & Birmingham Company, who unsuccessfully promoted the rival line from Tring by Oxford to Cheltenham, which had come to nothing in the hands of independent parties in 1835. This was the first move in the hostilities which afterwards ensued between the two Companies, and was of course regarded by the Great Western as a wanton attack on their natural territory.

CONSTRUCTION OF THE LINE

No time was lost after the safe passage of the Act in beginning work simultaneously at both ends of the line. On the 3rd September 1835 Brunel writes to Osborne and Ward, the Bristol lawyers, and to Townsend, the surveyor, that he had been instructed to set out the line between Bristol and Bath, and London and Reading, and asking them to take immediate steps to get the thick underwood in Brislington cut, so that he may be able on his arrival next week to determine definitely the exact course of the line and fix the points for the shafts to ascertain the nature of the soil through which the tunnels

were to go. He adds, "We shall have our flags flying over the Brent Valley to-morrow. I should not wish that Bristol should fancy itself left behind. I shall be down on Tuesday or Wednesday."

He had already got together a staff of assistants, and of these the chief, J. W. Hammond, was installed Resident Engineer at the London end, while G. E. Frere was despatched to take charge at Bristol. Little seems to have been left to them; Brunel himself, besides acting as Chief Engineer, was constantly dashing to and fro, keeping in close touch with every detail of the work and at once observing any faulty construction or bad workmanship on the part of contractors. In these early days and during the whole construction period the two Committees of the Board acted quite independently of each other in letting contracts and most other matters, the Bristol Committee being distinguished by its more lavish outlay on station buildings, architectural adornments and ornamental work generally. Evidence of this is noticeable at the present day, and early in 1839 we find the London members of the Board protesting against the unnecessary expenditure.

In view of this independence and the fact of the works going on simultaneously, it is convenient to take the sections of the line in the order in which they were eventually opened.

LONDON TO MAIDENHEAD

The first contract to be let was that for the viaduct across the Brent Valley, where, as we have seen, Brunel began operations. This was taken in November 1835 by Messrs. Grissell & Peto, who began work in the following February. The viaduct is of brick with stone

capitals, 300 yards long and 65 feet high, with eight arches of 70 feet span, each pier being composed of two slightly conical pillars. It was much the most important work between London and the Thames at Maidenhead, and was finished in the summer of 1837, when "in acknowledgement of the zealous and indefatigable attention of Lord Wharncliffe, as Chairman of the Committee on the Act of Incorporation in the House of Lords, it was, by his Lordship's permission, named the Wharncliffe Viaduct,"¹ and his coat of arms was carved on the centre of the south face. The viaduct is approached by high embankments, both of which gave much trouble for some time by continually slipping.

About a quarter of a mile west the line crosses the main Uxbridge Road and a by-road from Greenford towards Brentford at the point where they intersect. For this awkward situation Brunel designed a skew bridge of cast-iron girders, supported intermediately by two rows of eight pillars each between the main carriage road and its footpaths, the four in the middle adjoining the by-road being cast iron and the remainder brick. Apart from its peculiar design, this bridge is remarkable for the trouble it caused. Originally the spaces between the main and cross girders were filled by flat arches of brickwork but, one of the main girders having given way in March 1839, these were removed and a floor of six-inch planks substituted to lighten the weight. The timbers carrying the rails rested on the tops of the girders, and an upper floor, also of wood, covered the spaces between them. One day in May 1847 all this wood caught fire, probably from a piece of burning coke dropped by a passing engine, and burned fiercely, with

¹ Directors' Report of August 1837.



WHARNCLIFFE VIADUCT, HANWELL



UXBRIDGE ROAD BRIDGE

the result that nearly every girder in the structure was broken by the heat. After being temporarily shored up from the road for some little time, the bridge was renewed with wrought iron. Two years later Brunel wrote to one of the Directors:

Cast-iron girder bridges are always giving trouble—from such cases as the Chester Bridge,¹ and our Great Western road bridge at Hanwell, which since 1838 has always been under repair and has cost its first cost three times over, down to petty little ones, which either in frosty weather or from other causes are frequently failing. I never use cast iron if I can help it, but in some cases it is necessary and to meet these I have had girders cast of a particular mixture of iron carefully attended to, and I have taught them at the Bridgewater foundry to cast them with the flange downwards instead of sideways.²

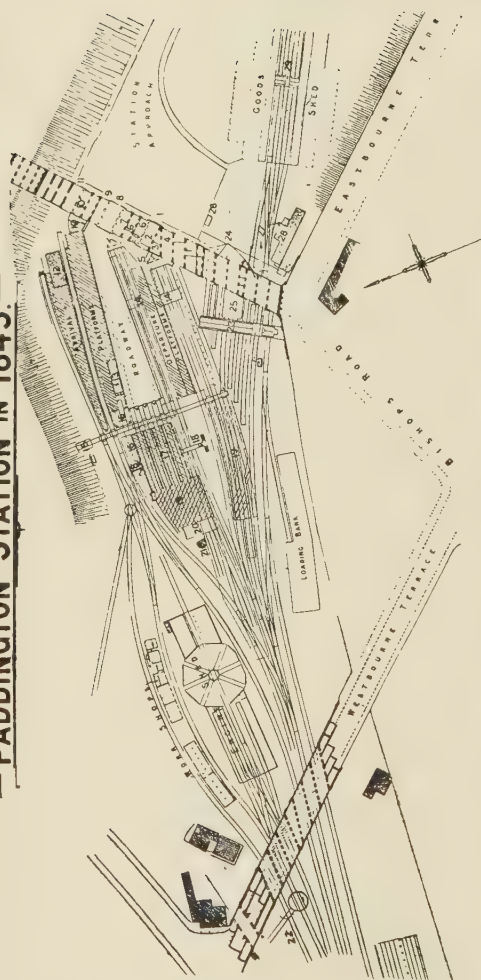
There were no other works of special interest on the 18 miles between Acton and the temporary terminus at Maidenhead or, strictly speaking, Taplow; it was on the Bucks side of the River.

On the Extension Line from Acton to Paddington, most of the $4\frac{1}{2}$ miles consisted of clay cuttings. Wherever owners and occupiers were complaisant the works were begun in the autumn of 1836; elsewhere, and especially near Paddington where roads had to be altered, nothing could be done till the Act was at last obtained on the 3rd July 1837. This provided for the northward diversion of the Harrow Road near the Westbourne Turnpike Gate, and the making of sundry bridges, including a wide road bridge in place of the existing footbridge over the Paddington Canal close to the intended depot of the railway and over the railway itself from the Harrow Road to Spring Street (now Eastbourne Terrace), whence a new road was to be made by the Company, in lieu of the footpath known as Bishop's

¹ See p. 343.

² Brunel's *Life*, p. 190.

— PADDINGTON STATION IN 1845. —

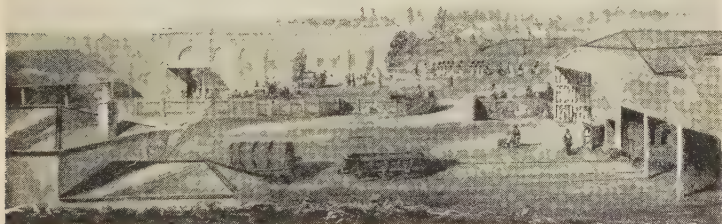


DESCRIPTION

- | | | | |
|--|---|--|---|
| 1. Verandah in front of booking hall. | 9. Carriage exit. | 17. Carriage shed with general offices over. | 24. Goods sidings and platforms under bridge. |
| 2. Booking hall. | 10. Lost property office. | 18. Steps giving access to offices. | 25. Carriage landing. |
| 3. Booking office. | 11. Arrival exit. | 19. Carriage sheds. | 26. Police office. |
| 4. Luggage way and auxiliary booking office. | 12. Up parcels office. | 20. Traversing table. | 27. Yard cranes. |
| 5. Station master's office. | 13. Arrival waiting rooms. | 21. Yardmen's shelter. | 28. Goods offices. |
| 6. Waiting rooms, etc. | 14. Traversing tables. | 22. Shear legs for lifting engines under repair. | 29. Traversing table. |
| 7. Down parcels office. | 15. Examination pit. | 23. Traversing table. | |
| 8. Carriage entrance. | 16. Overhead gangway, connecting with offices over carriage shed. | | |

Walk, to Black Lion Lane (Queen's Road and Porchester Road). Needless to say, this new road is the Bishop's Road of to-day.

A large quantity of land on both sides of the new bridge was acquired from the Bishop of London for the depot, Brunel's original intention being to make the passenger station where it is now, and to use the land north-west of the bridge for the goods depot and engine shed. The force of circumstances, however, compelled



FRONT OF ORIGINAL STATION, PADDINGTON

(with goods sheds and sidings in foreground)

him at first to reverse their positions. There was no time after the passing of the Act to build the permanent passenger station without considerably delaying the opening of the line, so, to avoid occupying the site, the space west of the bridge intended for the goods depot was taken for a temporary passenger station, and later on, when the Company began to carry goods traffic, a wooden goods shed was set up east of the bridge in the corner between it and Eastbourne Terrace, or Spring Street as it was then. These temporary arrangements were destined to last for sixteen years.

Bishop's Road Bridge itself formed the front of the passenger station, some of its arches being used as booking hall, waiting rooms, and offices, and others for carriage entrance and exit roads. It was reached only by an approach road from London Street. The rest of the station was constructed almost entirely of timber, the platforms being roofed over. No plan of its original state has survived; that on page 44 shows the station as it was in 1845, by which time several additions and alterations had been made. For instance, the two arrival platforms on the north side had been added before 1840.

Westward of the station the course of the railway lay through open country. Westbourne Road had been laid out and some houses built, but beyond this there were only a few scattered cottages and one or two fair-sized residences with large grounds. One of these, Westbourne Place, immediately west of Black Lion Lane, was occupied by Lord Hill, Commander-in-Chief of the British Army, whose name is perpetuated in "Lord Hill's Bridge" over the railway at Royal Oak. Opposite to it, east of the Lane, stood Westbourne Lodge, which the Company were obliged to buy, and which was for many years Charles Saunders' official residence.

By the end of August 1837 the works on several of the contracts between London and Maidenhead had been practically finished, and the Directors announced that all would be completed early in October, but that the laying of the permanent way would probably postpone the opening until November.

For the formation of the permanent way Brunel of course had ideas of his own. He had no great opinion of the stone blocks and iron chairs adopted by Stephenson

for supporting the rails at intervals, and as early as January 1836 had recommended the use of light rails on continuous bearings of timber. A year later he furnished a comparative estimate of the cost of the two methods of 65 lb. rails on blocks and chairs and 40 lb. rails on longitudinal timbers, admitting the additional expense of the latter to be about £500 a mile, but stating his confidence "that the excess will be amply repaid, in the few first years of working, in the diminution of the mere cost of repair and maintenance of the way; while the gain in economy, facility and perfection of transport would be cheaply purchased at double the cost."

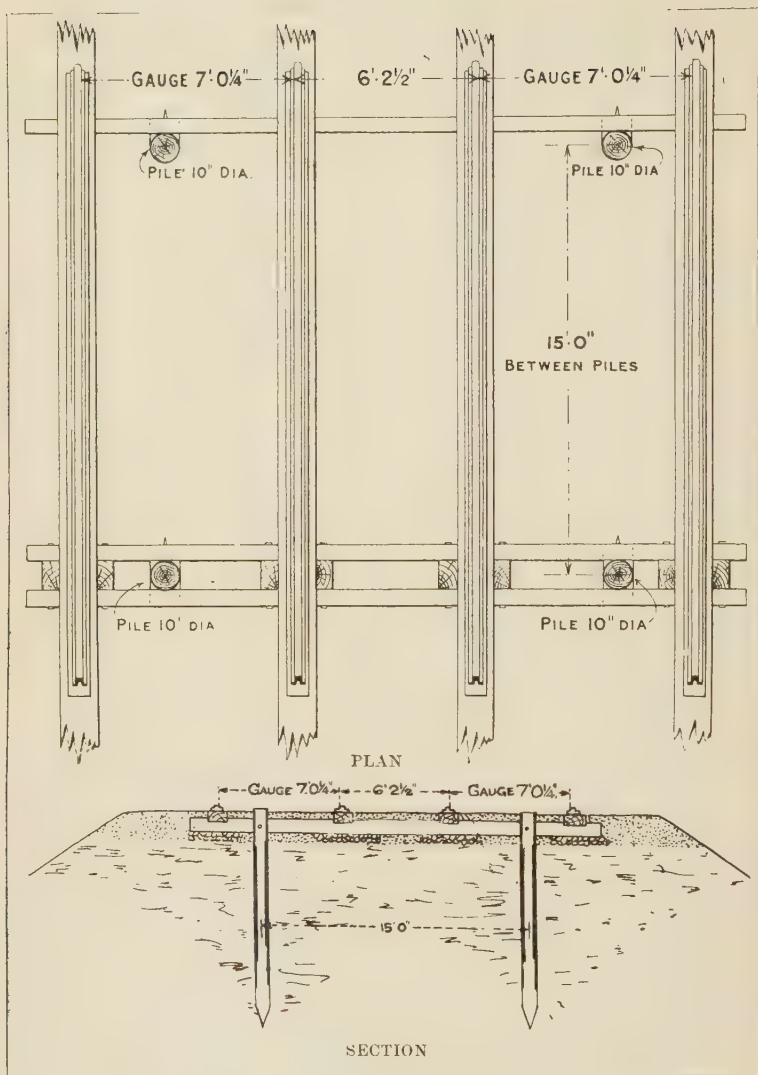
The construction actually adopted is thus described by Nicholas Wood: ¹

Longitudinal timbers of a scantling of from 5 to 7 inches in depth and 12 to 14 inches in breadth, and about 30 feet long are placed along the whole line. Then these timbers are bolted to cross sleepers or transoms at intervals of every 15 feet; double transoms each 6 inches broad and 9 deep being placed at the joinings of each of the longitudinal timbers, and single transoms of the same scantling being placed midway between the joinings. These transoms stretch across, and are bolted to all the four lines of rails.² Within the two lines of rails of each track piles of beech are driven from the upper surface of the Railway into the solid ground, so as to retain a firm hold thereof, and the transoms are bolted to the heads of the piles.

There was of course nothing new in the longitudinal timbers to carry the rails. As Brunel said in more than one of his reports, this was the oldest form of railway in England. The novel feature was the piles, which were intended not to support the timbers, but to hold them down. Brunel's reasons for adopting them are given at

¹ Report to Great Western Directors, 10th December 1838.

² This means the timbers which carried the rails.



ORIGINAL PERMANENT WAY, 1838

length in his report of January 1838, and more concisely by Wood, as follows:

The principle of construction is this; the longitudinal timbers and transoms being firmly held down by the piles, gravel or sand is beat or packed underneath the longitudinal timbers for the purpose of obtaining a considerable vertical strain upon the timbers upwards, and consequently to effect a corresponding firmness of foundation of packing underneath them. Without piles, the longitudinal timbers could not be packed in this manner, as there would be nothing to resist the pressure of the packing except their own weight, and the piles were therefore introduced to hold down the timbers and to render it practicable to introduce a force of packing underneath.

The whole structure therefore formed a timber frame, pegged down to the ground by the piles, some 20 feet wide, made up of the two tracks of 7 feet¹ each and an intervening space of 6 feet. As the uniform width of the railway was 30 feet throughout, barely 5 feet were left outside each track. The rails were specially designed by Brunel, and from the shape of their section became known as "bridge rails." They weighed 43 lbs. to the yard. To prevent their cutting into the timbers under the weight of the trains and also to cant them slightly inwards, a thin wedge-shaped layer of hard wood was interposed. All the timber was previously "kyanized." This was a process, then recently invented by a Dr. Kyan, for preserving wood by saturating it with a solution of corrosive sublimate, otherwise bichloride of mercury, in wooden tanks. It was superseded by creosote about 1840.



SECTION OF 43 LB.
BRIDGE RAIL

The Directors' expectation of opening the line in

¹ In laying the rails an extra quarter of an inch was allowed on the straight, making the gauge 7 ft. 0 $\frac{1}{4}$ in. strictly speaking, but it was always referred to as 7 feet.

November was far from being realised, for causes stated in their February Report as: (1) defective and leaky tanks for kyanizing such timber as had been delivered; (2) several months' delay in delivery of timber and rails—only half the quantity of timber contracted to be delivered in the summer had arrived by November, and much of the rails not till February; (3) the embarrassment caused by large quantities of timber arriving all at once; (4) the novel method of laying the permanent way requiring much care and supervision; and (5) the severe and prolonged frost, which “paralysed the exertions of the Engineer.” They do not mention the fact that the bridges and other works on the Extension Line to Paddington were very far from being finished, contenting themselves with saying that the “Works at Paddington are going on with spirit.” Having learnt caution, they now only quote the Engineer as considering that the work will be completed and the traffic commenced in the course of May.

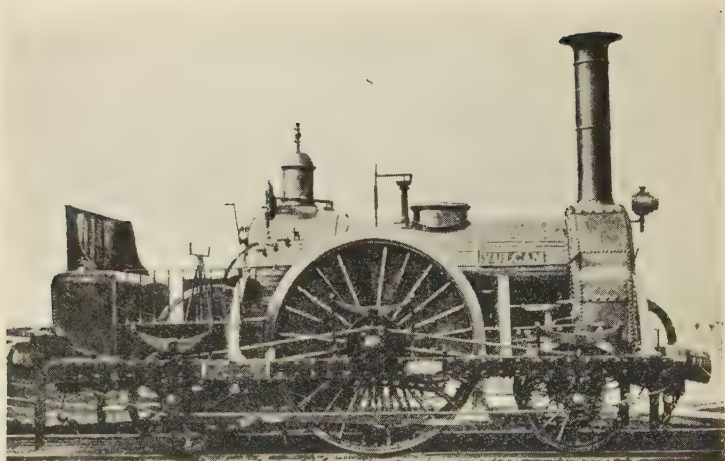
Meantime, the first Chairman of the Company, Benjamin Shaw, a shadowy figure of whom little more than his name is recorded, resigned in October 1837, and the Chair was offered to George Henry Gibbs, already mentioned as the leading London promoter of the railway. After taking advice of his Bristol relatives, Gibbs, “not without regret, though it relieved my mind from rather a heavy burthen,” declined the honour, and afterwards proposed his colleague on the London Committee, William Unwin Sims, another shadowy figure to-day, who took the Chair on the 26th October.

Two Directors, Roch and Wildes, had already retired and been succeeded on the Bristol and London Committees respectively by Frederick Ricketts, first Chairman

of the Bristol & Exeter Railway Company, and Charles Russell, M.P. for Reading, who, as Chairman of the Commons Committee on the Bill of 1835, had done much to help the birth of the Great Western, and was destined to do more in guiding its growth and development.

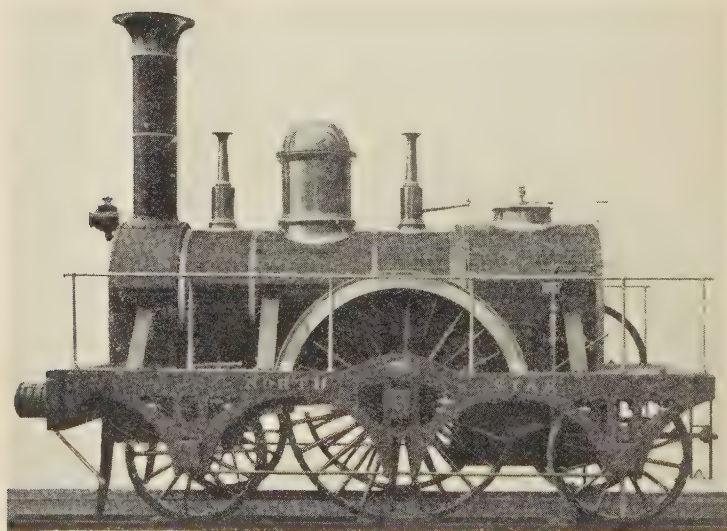
Another name destined to loom large in Great Western annals makes its first appearance about this time. An officer to take charge of the Locomotive Department under the Engineer being required, Brunel was authorised at the end of July to secure the services as "Superintendent of Locomotive Engines" of a youth not yet twenty-one, whom he recommended, named Daniel Gooch. Happening to go north immediately after this to see to the progress of the engines then building at Liverpool and Warrington, Brunel interviewed young Gooch at Manchester, where he was assisting an elder brother employed on the Manchester & Leeds Railway, and straightway engaged him. Gooch, of whom more will be said in another chapter, entered the Great Western service on the 18th August 1837 and, there being as yet no engines for him to superintend, began work by preparing plans for the engine houses at Paddington and Maidenhead.

Early in November the first two engines were delivered by canal at West Drayton. They had come by sea from Liverpool to London Docks, one named *Premier* from Mather, Dixon & Co. of Liverpool, the other, *Vulcan*, from the Vulcan Foundry at Warrington. Like all the early engines made to Brunel's order, they were remarkable for very large wheels and very small boilers and cylinders. At first there was no road ready for them to run upon, but by Christmas a mile and a half between Drayton and Langley had been finished, and *Vulcan* made



“ VULCAN ”

(After conversion into a tank engine)



“ NORTH STAR ”

(As reconstructed in its original form for the Centenary Exhibition at
Darlington 1925)

a trial trip on the 28th December, so becoming the first engine to run on the Great Western Railway. Stephenson's famous *North Star* was delivered by barge on the Thames at Maidenhead at the end of November, but there she had to stay for lack of rails till May 1838.

The first official trial of the two engines in the presence of some of the Directors was made on the 9th January. G. H. Gibbs, whose *Diary*¹ is a mine of information on Great Western affairs between 1836 and 1840, gives the following account of it:

Went down the line to West Drayton. Ealing Station is in a very unfinished state. The Hanwell embankment is not completed on either side, and none of the lines ballasted nor any piles driven; but I did not see anything to induce me to believe that everything might not be completed by the end of March. At West Drayton we were much pleased to find that the two engines were about to be tried. After walking with Brunel as far as the Chequers Bridge admiring the rails exceedingly, we returned to the Engine House. The Engines, after some delay in getting up steam, sallied forth, but the curve in the turn-out proving too sharp for them they got off the rail two or three times, and it was an hour before they could be got on the main line. When there, however, they performed beautifully and we had a very interesting drive.

After this, frequent trial trips were made by these and other engines at West Drayton, which was made the locomotive headquarters for the time being, an engine house, coke ovens,² and water supply being established there, as well as the office of the new Superintendent.

¹ Published in the Great Western Railway Magazine, 1909-10, and reprinted as a pamphlet.

² These ovens were superseded by those at Bristol soon after the opening of the whole line, and were eventually abolished as being useless and dilapidated early in 1850.

Progress with the laying of the permanent way was slow; according to Gibbs, only $5\frac{2}{3}$ miles of rails had been laid by the 12th April.

In his reminiscences of this period,¹ Gooch states that *North Star* was first in steam on the 15th January 1838, but says nothing of any trial trip. Gibbs wrote on 1st May:

Went to-day to Maidenhead and found two engines out *for the first time* with steam up. Brunel and his wife and Saunders were there and the trial went off exceedingly well. I rode on the "North Star," and found it very trying as I was not well, but the motion was very agreeable.

Soon he had a more exciting trip on *Thunderer*, that extraordinary locomotive freak with engine and boiler on separate carriages.

May 12th. Hammond came for me to Salt Hill² with Harrison's engine, and I went backward and forward on it twice. In some places we had the knocks which we had observed before at Drayton, but this we were told occurred only where the screws were not completely screwed down. Along the greatest part of the four miles the engine ran beautifully smooth and for some way we cleared sixty miles an hour.

Ten days later the Directors were able to travel on the railway from Bull's Bridge (Hayes), which even then was the chief depot for receiving from the canal and kyanizing the timber, over the eleven miles thence to Maidenhead Station. The latter was a wooden erection west of the Bath Road Bridge at Taplow, and about a quarter of a mile short of the river bridge, 22 miles

¹ *Diaries of Sir Daniel Gooch*, Kegan Paul, 1892. As regards the period before 1865 this title is a misnomer; "Reminiscences" would be more accurate.

² Half a mile west of Slough.

43 chains from the temporary terminus at Paddington. All traces of it have long since been swept away.

At last the line was ready. Again to quote Gibbs' Diary:

May 31st. This being the day appointed for the opening of our Railway, the Directors and the Company invited met at the Depot before 11. A very pretty sight it was. At 11.30 we entered the carriages of the first train, and proceeding at a moderate pace reached Maidenhead Station in 49 minutes, or at about 28 miles an hour. After visiting the works we returned to Salt Hill, where a cold luncheon for about 300 people was laid under a tent. After the usual complement of toasts we returned to the line and reached Paddington (19 miles) in 34 minutes, or 33½ miles an hour.

The engine employed on this first train was *North Star*, the only one of the ten at Gooch's disposal on which he could really rely. A Bristol Director, T. R. Guppy, distinguished himself by walking along the tops of the carriages from one end of the train to the other while it was going at full speed,¹ doubtless on the return journey after luncheon.

The public opening was fixed for the following Monday, 4th June 1838, and advertised in the London and Bristol papers.

¹ *The Times*, 2nd June 1838.

GRREAT WESTERN RAILWAY.—The public are informed that this RAILWAY will be OPENED for the CONVEYANCE of PASSENGERS only between London, West Drayton, Slough, and Maidenhead station, on Monday, the 4th June. The following will be the times for the departure of trains each way, from London and from Maidenhead, (excepting on Sundays,) until further notice:—

Trains each way.
8 o'clock morning; 4 o'clock afternoon.
9 o'clock ditto 5 o'clock ditto
10 o'clock ditto 6 o'clock ditto
12 o'clock noon 7 o'clock ditto

Trains on Sundays each way.
7 o'clock morning; 5 o'clock afternoon.
8 o'clock ditto 6 o'clock ditto
9 o'clock ditto 7 o'clock ditto

Each train will take up or set down passengers at West Drayton and Slough.

Fares of Passengers.

	First Class.		Second Class.	
	Posting Carriage.	Passenger Coach.	Coach.	Open Carriage.
	s. d.	s. d.	s. d.	s. d.
Paddington Station { to West Drayton	4 0	3 6	2 0	1 6
{ to Slough	5 6	4 6	3 0	2 6
{ to Maidenhead	6 6	5 6	4 0	3 6

Notice is also given that on and after Monday, the 11th June, carriages and horses will be conveyed on the railway, and passengers and parcels booked for conveyance by coaches in connexion with the Railway Company to the west of England, including Stroud, Cheltenham, and Gloucester, as well as to Oxford, Newbury, Reading, Henley, Marlow, Windsor, Uxbridge, and other contiguous places. By order of the Directors,
CHARLES A. SAUNDERS, } Secs.
THOMAS OSLER.

From The Times, 2nd June 1838

Note.—The conveyance of Carriages was afterwards postponed to 4th August, and of Horses till the following month.



EALING STATION, 1869

Brunel's former chief clerk at 18 Duke Street, Westminster, a young man named Seymour Clarke, had been appointed Traffic Superintendent.

The stations at Ealing and Hanwell were not yet ready for use. They were opened in December, and another at Southall on the 1st May 1839.¹

It will be noticed that passengers were to be conveyed to and from Slough, though no station might be made there. The Directors had promised this in their Report of August 1837.

An enactment in the Bill precludes the Directors from constructing any Station or Depot within three miles of Eton College without the consent of the Provost and Fellows of that Establishment, which it is feared will deprive the Public of that accommodation to which they would otherwise be justly entitled at the hands of the Company.

The trains will of course convey any Passengers who may be desirous of travelling to and from the neighbourhood of Slough, and the Directors can only regret that they are not at liberty to provide the ordinary conveniences of a Station for Persons waiting there to be received on the Railway.

No sooner had the Company's intentions been advertised than the said Provost and Fellows, furious at this insidious attack on the morals of their school, applied to the Court of Chancery for an immediate injunction to stop such an evasion of the spirit of the Act. On the 1st June their application was dismissed with costs. Of course they appealed, but the Lord Chancellor decided that the Directors were quite within their rights in stopping the

¹ Additional stations were opened as follows: Langley 1845, Hayes 1864, Acton 1868, Castle Hill (renamed West Ealing in 1899) and Westbourne Park 1871, a new Taplow ($\frac{1}{4}$ mile east of the old "Maidenhead," which was then abolished) 1872, Burnham Beeches 1899, and lastly Iver at the end of 1924.

trains, and were not even guilty of a breach of faith, as had been suggested, because they had made no agreement whatever with the College authorities; they had opposed the clause throughout; it was forced on them, and therefore they were clearly entitled to do anything not expressly forbidden by it.

The Eton masters were not long in recognising the advantages of the railway, for, strange to say, within a month of their defeat and while the appeal was pending, they requested the Company to provide a special train to take the boys up to town for the Coronation on the 28th June! It was duly provided.

Towards the end of the next year the Provost and Fellows gave way to the clamour of their neighbours—whether any Royal pressure was exercised we know not—and consented to the erection of a station and to the repeal of the forbidding clauses. A station was accordingly opened at Slough in June 1840. It consisted of two separate buildings, some distance apart, for Down and Up traffic respectively, both on the south side of the railway as at Reading, the Up station being the eastern of the two. In the meantime passengers were booked, first at the Crown Inn till September 1838, and afterwards at “the New House in Stoke Lane.”

The opening for passenger traffic took place as advertised on Monday, 4th June. Gibbs recorded the event thus:

Our Railway opened to the public this morning. I went to Maidenhead by the first train and came back by the third, which started from Maidenhead at 10.15. I was disappointed with regard to the speed, as we were 1 hour and 20 minutes going down and 1 hour and 5 minutes coming up. If from the 65 minutes we deduct 4 lost at Drayton, 3 at Slough, and 4 between the two places in slackening and getting up the speed, there remain 54 minutes for 23 miles or $25\frac{1}{2}$ miles an hour. We carried altogether to-day 1,479 people and took £226.

The opening was indeed far from auspicious; the road was very rough, the jolting of the carriages excessive, and the engines generally unreliable. By the end of the first week, during which 10,360 passengers were carried and £1,552 taken, it had become evident that Brunel's elaborate and expensive permanent way was anything but



THE SLOUGH STATIONS, *c.* 1860

a success, though some of the trouble was attributed to faulty springs of the carriages.

All sorts of exaggerated reports were soon spread broadcast, and the shareholders naturally became excited and anxious. A considerable number, especially in Liverpool and the north, had from the first been opposed to Brunel and his wide gauge, and had only with difficulty been kept quiet by the Directors. They now became very demonstrative and troublesome.

At this stage we cannot do better than quote some extracts from Gibbs' Diary. As will be seen, he was Brunel's chief supporter during all this anxious time.

June 20th. Our position is this—at our opening there has been some little disappointment as to our speed and the smoothness of our line, and there is some difficulty in ascertaining how much of this defect is to be traced to the line and how much to the carriages. In the meantime shares have fallen to 16¹ and reports of all kinds have been set afoot by the advocates of the old system and by many interested parties to depreciate the whole concern. Brunel's character and reputation therefore, as well as our own peace and comfort, demand our best attention at this moment to the repacking of the line, the changes which have been suggested in the springs, etc.

June 21st. The most ridiculous reports were in circulation to-day about the bridge² and we were so pestered with inquiries that it became necessary to prepare some sort of report to tranquillise the shareholders. I went with Casson³ and Sims to Paddington for that purpose and stayed there till 10 at night. Our difficulties were increased by the facts that the road is evidently deteriorating under the pressure of the trains, that the engines are getting out of order from too much use, and that our carriages are far from easy. Brunel acknowledged that the road was decidedly in a very bad state, arising as he believed from two causes—from his having ballasted with fine gravel instead of coarse and from his not having ballasted deep enough. It was agreed that two experiments should be tried, of half a mile each, one of relaying the ballasting with coarse gravel 18 in. deep well rammed, the other of releasing the timbers from the piles and relaying as above. Alterations were made in the trains to give rest to the engines and to allow of the above experiments being made. Alterations were also ordered in the carriages.

The tranquillising report was issued at once in the form of a circular to shareholders signed by the Chairman. While admitting “an uneasy movement” of the carriages,

¹ 16 premium; they had been at 30 not long before the opening.

² Maidenhead River Bridge in course of construction.

³ J. L. Casson, an active Director who succeeded W. Tite in February 1838. Tite, afterwards Sir William, disapproved of Brunel and later promoted narrow-gauge lines in the West of England.

it alleges that this is confined to certain parts of the line, and is due to want of hard packing under the timbers. Wherever engines had been able to run previous to the opening, "the rails answer all the expectations which could reasonably be entertained," but "in other places and principally between Southall and London where no engines could run, from the Line only being completed just in time for the opening, the defective packing could not be discovered until the pressure of the trains manifested it. A very uneasy movement in some of the carriages has given rise to a rumour that the plan has totally failed, and the rails must be altered. The Directors entertain no such opinion. They are convinced that, as far as the rails are concerned, the remedy can and will be easily administered by a thorough repacking under the timbers with coarse gravel, which is now in progress, and with a favourable result."

The circular goes on to attribute the chief cause of the "roughness" to the springs of some of the carriages and the position of the axles under the bodies, all of which were being altered.

The Liverpool Proprietors, far from being tranquillised by this story, demanded a special meeting, whereupon the Directors offered instead to adjourn the ordinary half-yearly meeting in August to give time for consideration of their Report—in those days the Shareholders knew nothing of the reports till they were read to them at the meetings—and this was assented to.

July 13th. Went after dinner to the depot and saw Casson and Saunders there. The latter said he had not dined or breakfasted at home since our opening. He showed me a letter he had just received from Brunel expressed in a cool and very proper way, but showing great feeling with regard to the loss of confidence which he believes he has seen on the part of the Directors

and even of Saunders. Poor fellow, I pity him exceedingly, and I know not how he will get through the storm which awaits him. With all his talent he has shown himself deficient, I confess, in general arrangement. There have been too many mistakes; too much of doing and undoing. The draining, I fear, is imperfect, and the carriages made under his direction have not worked well; but I cannot help asking myself whether it is fair to decide on a work of this kind within a few weeks of its opening; and is not the present outcry created in a great measure by Brunel's enemies. I hear that at the meeting Brunel's dismissal is to be moved. Now the strong bias of my mind is that our only chance of comfort and safety is that our line should be carried out by Brunel with efficient assistance and on a more stringent system of control, unless Stephenson will join him on the principle of abandoning his granite blocks and following out Brunel's wide gauge. It can only be done by Brunel himself, and, even if Stephenson would join him, I doubt much if they would work well together.

A few days later Brunel himself suggested that two or three other engineers should be called in to survey the line and report on the permanent way. Casson proposed at the Board that Robert Stephenson should be associated with Brunel "on a system of mutual concession," but Gibbs, Russell, Sims the Chairman, and two other Directors were for retaining Brunel, who offered to resign, and this was rejected. The same evening Gibbs, Casson, and Saunders went to inspect the London & Birmingham Railway, then open as far as Denbigh Hall,¹ in Buckinghamshire.

July 17th. Went last night with Casson and Saunders to Denbigh Hall by the Birmingham Railway in a first class carriage to see and try the line, and having slept at Stony Stratford, we returned this morning in an open carriage. We were 2 hours going, stopping twice, being at the rate of $23\frac{1}{2}$ miles an hour, and $2\frac{1}{2}$ hours in returning, being at the rate of 18 miles an hour. The carriages and engines are much lighter than ours. The engines make much less noise and the general noise is less, but the wheels on the rails make more. The bumps or jolts at the

¹ Not far north of Bletchley, and about 47 miles from Euston.

joints are very frequent indeed, and are in some places very uncomfortable, and the joints show plainly the effect of the heavy blows they receive. The serpentine or lateral motion, of which we have none on our railway, is very striking; but, on the other hand, they have no pitching or see-saw motion whatever, produced with us by the yielding of the timber between the piles. The road is under repair in many places, 440 people being employed on it, and they have still an immense expense to incur in replacing the temporary transverse wooden sleepers on the embankments by stone blocks.



MAIDENHEAD STATION, *c.* 1850

Gibbs was evidently much relieved at finding Stephenson's road very little, if at all, better than Brunel's. For the next month he and the other Directors were engaged in making arrangements to combat the opposition of "the Liverpool people" at the coming Half-yearly Meeting.

CHAPTER III

THE FIGHT FOR THE BROAD GAUGE

Advice sought—Nicholas Wood—Brunel's August Report—Increased Estimate—John Hawkshaw—His Report—Brunel's Reply—Wood's Report—The Crisis—Brunel ready to resign—North Star—Gooch—The Special Meeting—Victory.

TOWARDS the end of July the Directors decided to adopt Brunel's own suggestion and call in other engineers to inspect and report to them on the permanent way, the gauge, and generally on the novel system which had been adopted, including the construction and efficiency of the engines. Three of the most eminent authorities on railway construction of the time, James Walker, President of the Institution of Civil Engineers, Robert Stephenson, and Nicholas Wood were accordingly asked to undertake the task. Walker and Stephenson both declined, the former "under the impression that the question would be controversially conducted," the latter "on the ground that his opinions were known to be somewhat unfavourable to the methods adopted in construction of the permanent road, and that he did not wish to be engaged in a professional discussion upon them." Wood alone accepted the invitation, but was unable to begin his inspection till September.

Meantime, Brunel was directed to report fully on all the matters at issue in time for the Half-yearly Meeting on the 15th August. So much of his report as relates to the 7 foot gauge is as follows. His position had

been somewhat strengthened by the decision of a Royal Commission in favour of 6 feet 2 inches as the standard gauge for all railways in Ireland.

The peculiarity of the circumstances of this railway, to which I would more particularly refer, and which have frequently been mentioned, consist in the unusually favourable gradients and curves, which we have been able to obtain. With the capability of carrying the line upwards of 50 miles out of London on almost a dead level, and without any objectionable curve, and having beyond this, and for the whole distance to Bristol, excellent gradients, it was thought that unusually high speed might easily be attained, and that the very large extent of passenger traffic which such a line would certainly command, would ensure a return for any advantages which could be offered to the public, either in increased speed or increased accommodations. With this view every possible attention was paid to the improvement of the line as originally laid down in the parliamentary plans; and after much labour bestowed in the setting out the line, we ultimately succeeded in determining a maximum gradient of four feet per mile, which could be maintained for the unusual distance before mentioned of upwards of 50 miles from London and also between Bristol and Bath, comprehending those parts of the line on which the principal portion of the passenger traffic will be carried. The attainment of high speed appeared to involve the question of the width of gauge, and on this point accordingly I expressed my opinion at a very early date.

It has been asserted that 4 feet 8 inches, the width adopted on the Liverpool and Manchester railway, is exactly the proper width for all railways, and that to adopt any other dimension is to deviate from a positive rule which experience has proved correct; but such an assertion can be maintained by no reasoning. Admitting, for the sake of argument, that under the particular circumstances in which it has been tried, 4 feet 8 inches has been proved the best possible dimension, the question would still remain—What are the best dimensions under the circumstances?

Although a breadth of 4 feet 8 inches has been found to create a certain resistance on curves of a certain radius, a greater breadth would produce only the same resistance on curves of greater radius.

If carriages and engines, and more particularly if wheels and axles of a certain weight, have not been found inconvenient upon one railway, greater weights may be employed, and the same results obtained on a railway with better gradients.

To adopt a gauge of the same number of inches on the Great Western as on the Grand Junction railway would, in fact, amount practically to the use of a different gauge in similar railways. The gauge which is well adapted to the one, is not well adapted to the other, unless, indeed, some mysterious cause exists which has never yet been explained for the empirical law which would fix the gauge under all circumstances.

Fortunately, this no longer requires to be argued, as too many authorities may now be quoted in support of a very considerable deviation from this prescribed width, and in every case this change has been an increase.

I take it for granted that in determining the dimensions in each case due regard has been had to the curves and gradients of the line, which ought to form a most essential, if not the principal, condition. In the report of the commissioners upon Irish railways, the arguments are identically the same with those which I used when first addressing you on the subject in my report of October 1835.¹

The mechanical advantage to be gained by increasing the diameter of the carriage wheels, is pointed out, the necessity to attain this, of increasing the width of way; the dimensions of the bridges, tunnels, and other principal works, not being materially affected by this, but on the other hand, the circumstances which limit this increase being the curves on the line, and the increased proportional resistance on inclinations (and on this account, it is stated to be almost solely applicable to very level lines) and lastly, the increased expense, which could be justified only by a great traffic.

The whole is clearly argued in a general point of view, and then applied to the particular case, and the result of this application is the recommendation of the adoption of 6 feet 2 inches on the Irish railways. Thus an increase in the breadth of way to attain one particular object, viz.: the capability of increasing the diameter of the carriage wheels, without raising the bodies of the carriages, is admitted to be most desirable, but is limited by certain circumstances, namely—the gradients and curves of the line, and the extent of traffic.

Every argument here adduced, and every calculation made, would tend to the adoption of about 7 feet on the Great Western Railway.

The gradients of the lines laid down by the Irish commission are considerably steeper than those of the London and Birming-

¹ The report referred to is dated 15th September 1835. See page 32.

ham railway, and four and five times the inclination of those on the Great Western Railway; the curves are, by no means, of very large radius; and indeed the commissioners, after fixing the gauge of 6 feet 2 inches, express their opinion that upon examination into the question of curves, with the view to economy, they do not find that the effect is so injurious as might have been anticipated, and imply therefore, that curves, generally considered of small radius on our English lines, are not incompatible with the 6 feet 2 inch gauge; and lastly, the traffic, instead of being unusually large, so as to justify any expense beyond that absolutely required, is such as to render assistance from government necessary to ensure a return for the capital embarked. As compared with this, what are the circumstances in our case? The object to be attained is the placing an ordinary coach body, which is upwards of 6 feet 6 inches in width, between the wheels: this necessarily involves a gauge of rail of about 6 feet 10 inches and a half to 6 feet 11 inches, but 7 feet allows of its being done easily; it allows, moreover, of a different arrangement of the body, it admits all sorts of carriages, stage coaches and carts to be carried between the wheels. And what are the limits in the case of the Great Western Railway as compared to those on Irish railways? Gradients of one fifth the inclination, very favourable curves, and probably the largest traffic in England.

I think it unnecessary to say another word to shew that the Irish commissioners would have arrived at seven feet on the Great Western Railway by exactly the same train of argument that led them to adopt 6 feet 2 inches in the case then before them.

All these arguments were advanced by me in my first report to you, and the subject was well considered. The circumstance of the Great Western Railway, and other principal railways likely to extend beyond it, having no connection with other lines then made, leaving us free from any prescribed dimension, the seven feet gauge was ultimately determined upon. Many objections were certainly urged against it; the deviation from the established 4 feet 8 inches was then considered as the abandonment of a principle; this, however, was a mere assertion, unsupported even by plausible argument and was gradually disused; but objections were still urged, that the original cost of construction of all the works connected with the formation of the line must be greatly increased; that the carriages must be so much stronger, that they would be proportionably heavier; that they would not run round the curves, and would be more liable to run off the rails; and particularly that the increased length of the axles would render them liable to be broken; and these objections were not advanced as difficulties which, existing in all railways, might be somewhat increased by

the increase of gauge, but as peculiar to this, and fatal to the system.

With regard to the first objection, namely the increased cost in the original construction of the line, if there be any, it is a question of calculation which is easily estimated, and was so estimated before the increased gauge was determined upon. Here, however, preconceived opinions have been allowed weight in lieu of arguments and calculations; cause and effect are mixed up; and without much consideration, it was assumed at once that an increased gauge necessarily involved increased width of way and dimensions of bridges, tunnels, etc.

Yet such is not the case within the limits we are now treating of: a 7 feet rail requires no wider bridge or tunnel than a 5 feet; the breadth is governed by a maximum width allowed for a loaded waggon, or the largest load to be carried on the railway, and the clear space to be allowed on either side beyond this.

On the Manchester and Liverpool Railway this total breadth is only 9 ft. 10 inches, and the bridges and viaducts need only have been twice this, or 19 feet 8 inches—9 feet 10 inches was found, however, rather too small, and in the London and Birmingham, with the same width of way, this was increased to 11 ft. by widening the interval between the two railings.

In the space of 11 ft. allowed for each rail, a 7 feet gauge might be placed just as well as a 5 feet leaving the bridges, tunnels, and viaducts exactly the same, but 11 feet was thought by some still too narrow; and when it is remembered that this barely allows a width of 10 feet for loads, whether of cotton, wool, agricultural produce, or other light goods, and which are liable also to be displaced in travelling, 13 feet (which has been fixed upon in the Great Western Railway, and which limits the maximum breadth, under any circumstance, to about 12 feet) will not be found excessive.

It is this which makes the minimum width, actually required under bridges and tunnels 26 feet instead of 22 feet, and not the increased gauge.

The earthwork is slightly affected by the gauge, but only to the extent of 2 feet on the embankment, and not quite so much in the cuttings; but what, in the practice, has been the result? The bridges over the railway, on the London and Birmingham, are 30 feet, and the width of viaducts 28 feet; on the Great Western Railway they are both 30 feet; no great additional expense is therefore incurred on these items, and certainly a very small one compared to the increased space gained, which as I have stated, is from 10 to 12 feet. In the tunnels exists the greatest difference; on the London and Birmingham Railway, which I refer to as being the best and most analogous case to that of the

Great Western Railway, the tunnels are 24 feet wide. On the Great Western Railway the constant width of 30 feet is maintained, more with a view of diminishing the objections to tunnels and maintaining the same minimum space which hereafter may form a limit to the size and form of every thing carried on the railway, than from such a width being absolutely necessary.

Without pretending to find fault with the dimensions fixed, and which have, no doubt, been well considered, upon the works on other lines, I may state that the principle which has governed has been to fix the minimum width, and to make all the works the same, considering it unnecessary to have a greater width between the parapet walls of a viaduct which admits of being altered, than between the sides of a tunnel which cannot be altered.

The embankments on the London and Birmingham Rly. are 26 feet, on the Great Western 30 feet, making an excess of about $6\frac{1}{2}$ per cent. on the actual quantity of earthwork.

The difference in the quantity of land required is under half an acre to a mile. On the whole the increased dimensions from 10 feet to 12 will not cause any average increased expense in the construction of the works and purchase of land, of above 7 per cent.—8 per cent. having originally been assumed in my report in 1835 as the excess to be provided for.

With respect to the weight of the carriages, although we have wheels of 4 feet diameter, instead of 3 feet, which of course involves an increased weight, quite independent of the increase of width, and although the space allowed for each passenger is a trifle more, and the height of the body greater, yet the gross weight per passenger is somewhat less.

		Tons. cwt. qrs. lbs.			
A Birmingham first-class coach weighs ...		3	17	2	0
Which with 18 passengers at 15 to the ton		1	4	0	0
		<hr/>			
		5	1	2	0

Or 631 lbs. per passenger.

A Great Western first-class weighs...	...	4	14	0	0
And with 24 passengers ...	...	1	12	0	0
		<hr/>			
		6	6	0	0

Or 588 lbs. per passenger.

And our 6 wheeled first-class ...	...	6	11	0	0
With 32 passengers ...	...	2	2	2	0
		<hr/>			
		8	13	2	0

Or 600 lbs. per passenger.

Being an average of 594 lbs. on the two carriages.

This saving of weight does arise from the increased width and is notwithstanding the increased strength of the framing and the increased diameter and weight of the wheels; I have not weighed our second-class open carriages, but I should think the same proportion would exist.

As to the breaking of axles or running off the line, the practical result has been that, from some cause or other, we have been almost perfectly free from those very objections which have been felt so seriously on some other lines. Far from breaking any engine axles, not even a single cranked axle has been strained, although the engines have been subjected to rather severe trials. One of our largest having, a short time back, been sent along the line at night when it was not expected, came in collision with some ballast waggons, and was thrown off the line nearly 6 feet; none of the axles were bent, or even strained in the least, although the front of the carriage, a piece of oak of very large scantling, was shattered. After ten weeks running, one solitary instance has occurred of a carriage in a train getting off the line and dragging another with it and which was not discovered till after running a mile and a half. As the carriage was in the middle of the train, and one end of the axle was thrown completely out of the axle-guard, there must evidently have been some extraordinary cause—possibly a plank thrown across the railway by a blow from the carriage which preceded, and which might have produced the same effect on any railway; and at any rate it was a strong trial to the axle, which was not broken, but merely restored to its place, and the carriage sent on to London. The same mode of reasoning which has by some been used in favour of the 4 feet 8 inch gauge, if applied here, would prove that long axles are stronger than short, and wide rails best adapted for curves. All that I think proved however, is this—that the increased tendency of the axles to break, or of the wheels to run off the rails, is so slight that it is more than counter-balanced by the increased steadiness from the width of the base, and the absence of those violent strains which arise from irregularity on the gauge and the harshness of the ordinary construction of rails. In fact, not one of the objections originally urged against the practical working of the wide gauge has been found to exist, while the object sought for is attained, namely, the capability of increasing at any future period, the diameter of the wheels, which cannot be done, however desirable it may hereafter be found, with the old width of rail. This may be said to be only prospective; but in the meantime, contingent advantages are sensibly felt in the increased lateral steadiness of the carriages and engines, and the greater space which is afforded

for the works of the locomotives: and here I wish particularly to call your attention to the fact that this prospective advantage—this absence of a most inconvenient limit to the reduction of the friction, which, with our gradients, forms $\frac{1}{3}$ ths, or 80 per cent. of the total resistance—was the object sought for, and that at the time of recommending it, I expressly stated as follows:—"I am not by any means prepared at present to recommend any particular size of wheel, or even any great increase of the present dimensions. I believe they will be materially increased; but my great object would be in every possible way to render each part capable of improvement and to remove what appears an obstacle to any greater progress in such a very important point as the diameter of the wheels, upon which the resistance, which governs the cost of transport and the speed that may be obtained, so materially depends."

These advantages were considered important by you, they are now considered so by many others; and certainly everything which has occurred in the practical working of the line confirms me in my conviction that we have secured a most valuable power to the Great Western Railway, and that it would be folly to abandon it.

Such was Brunel's defence of his 7 foot gauge. Much of it must be admitted to savour of special pleading. He founds his case on the wonderfully straight and level line he had laid out between London and Bristol with its possibilities of great speed and large passenger traffic, arguments which would not apply to the Cheltenham & Great Western Union, and still less to the South Devon and other broad-gauge railways of the future. On his showing, the gauge of each railway should be determined by its gradients and curves.

The report goes on to defend in somewhat guarded language the construction and efficiency of the engines, which, in Brunel's opinion, "have proved to be well adapted to the particular task for which they were calculated, namely, high speeds; but circumstances prevent their being beneficially applied to this purpose at present, and they are, therefore, working under great disadvantages. An engine constructed expressly for a

high velocity cannot, of course, be well adapted to exert great power at a low speed ; neither can it be well adapted for stopping frequently and regaining its speed."

The bad state of the permanent way is admitted, and attributed to defective packing under the longitudinal timbers, which caused the piles to aggravate the trouble by actually supporting the timbers at intervals instead of holding them down, as they were intended to do. That part of the road which had been laid under Brunel's own eye answered fully his expectations, and there the piles did answer their purpose and caused no inconvenience, but he was prevented by a serious accident—a bad fall into the hold of the "Great Western" steamship on the 1st April—from superintending the rest and seeing that sufficiently hard packing material was used and properly rammed under the timbers. This was in course of improvement by the gradual substitution of eighteen inches of coarse gravel under each timber, "necessarily a slow expensive and laborious operation." Though very loth to do so, Brunel had evidently already made up his mind to abandon the use of the piles in future. He writes :

I find that the system of piling involves considerable expense in the first construction, and requires perhaps too great a perfection in the whole work, and that if the whole or a part of this cost were expended in increasing the scantling of timber and weight of metal, a very solid continuous rail would be formed ; for this as a principle, as for the width of gauge, I am prepared to contend and to stand or fall by it, believing it to be a most essential improvement where high speeds are to be obtained. I strongly urge upon you not to hesitate on these two main points, which, combined with what may be termed the natural advantages of the line, will eventually secure to you a superiority which under other circumstances cannot be attained.

This report of Brunel's, together with that of the Directors, was read at the Half-yearly Meeting held at the

Merchants' Hall, Bristol, on the 15th August 1838, and ordered to be printed and circulated. The Hall was crowded, and the opposition present in great force. Disarmed by the conciliatory spirit and good humour of the Chairman, Sims, they were very polite to the Directors and even went so far as to praise much of their work. Several objectionable resolutions were, however, proposed, such as that another engineer should be associated with Brunel and that a vacancy on the Board should be filled by their nominee, which, says Gibbs, "would have been pressed to a division if they had known, as I did, that they had a majority." The great increase in the probable cost of the line, now estimated at £4,568,928, exclusive of locomotive power and carriages, was even accepted as not extraordinary in the light of the experience of other railways and the necessarily conjectural nature of the former estimate. Eventually the meeting, after lasting seven hours, was adjourned to the 10th October to give time for consideration of the voluminous reports.

In spite of their good humour at the Meeting, the Liverpool party were far from satisfied with the position, and during the next six months their leaders were in constant and often unpleasant communication with the Directors. At the end of August the latter agreed to meet their wishes by calling in John Hawkshaw, a young man of twenty-seven, then Engineer of the Manchester & Leeds Railway, as a second engineer with Wood to report and advise on Brunel's methods. Hawkshaw at once accepted, and during September he and Wood, the latter assisted by the egregious Dr. Dionysius Lardner, were engaged separately in carrying out experiments on the line.

Meanwhile the leaders of the opposition, dissatisfied with Brunel's report, were pressing for the appointment of a consulting engineer and the admission of one at least of themselves to the Board. The Directors were divided; the Chairman and others were in favour of yielding to both demands, but Gibbs, who appears to have had more influence, though willing to agree to a consulting engineer, was adamant against any Liverpool colleagues on the Board, foreseeing a constant struggle and being loth, as he puts it, to abandon Saunders and Brunel. The latter, he writes on 17th September, "is at present almost broken hearted, and in this state of mind he cannot exert himself, but if we treat him judiciously he will do what is right, and it will be our own fault if we do not make him an invaluable servant for the future."

Reports were received from both Wood and Hawkshaw in the first week of October. That of the former was merely a statement of the course he was pursuing to arrive at a conclusion later on. He, or rather Dr. Lardner on his behalf, had made many elaborate experiments on the Great Western, and was about to make similar experiments on other railways. Meantime he offered no opinion on any of the matters referred to him.

Hawkshaw's report on the other hand was a very definite condemnation of all Brunel's work, and a recommendation that the 4 feet 8½ inches gauge should be adopted and the line already open taken up forthwith and relaid accordingly. This proposal was backed by figures showing that more than £30,000 would thereby be actually saved on the whole line after making full allowance for scrapping the existing engines and other stock. He based his opinion more on commercial than on engineering grounds, assuming, as he says, that the

Directors' object is to make a railway that will pay its proprietors, "because it is one thing to design that which shall be pleasing in outline and grand in dimensions, and quite another thing to design that which under all the circumstances shall best answer the ends in view, one of those ends being to obtain a return for the capital invested." Having reckoned the amount of traffic to be expected, he considered that the greatly enlarged capacity of the engines, carriages, and road was not warranted, and was in fact sheer waste of money.

His chief argument against the 7 foot gauge was, however—what alone was destined eventually to kill it—the isolation which he foresaw would be entailed, at any rate as to branch and collateral traffic, on any line of a different gauge from its neighbours.

The main reason in my view for abiding by the 4 feet 8½ inch gauge in this country is that it has been generally adopted and that there are no very substantial grounds for altering it. I have never heard anyone, whose opinion I should esteem of great value from their experience of the working of locomotives on railways, wish for more than a few inches of additional width, five or six inches at the utmost; and even as to this increase, just in proportion as the parties had had much to do with the working of the locomotives on railways, so in the same proportion did they esteem even it to be of minor importance.

Perhaps, if railways were just commencing in this country, an addition of a few inches, five or six at the most, might be made; but the advantage to be gained by making it now, in my opinion, would in no manner compensate the evil that will arise from a variety of gauges in the same country.

Hawkshaw is bold enough to question Brunel's axiom, which had been accepted by the Irish Commissioners, that friction was diminished by the use of large wheels. The engines he considered much too heavy and powerful—Gooch would hardly have agreed with him here!—and compares them to the building of "a ship of 200 tons

burthen when there was no probability of ever obtaining a cargo of half the weight." On the permanent way he was specially curt and scathing.

The mode adopted in laying the rails is, I think, attempting to do that in a difficult and expensive manner, which may be done at least as well in a simple and more economical manner.

This is all the young man has to say on one of the matters he was specially invited to report and advise upon. No wonder Gibbs characterised his report as "a very ill-natured production from beginning to end, the greater part of which might have been written without coming near the line."¹ Ill-natured or not, it made the Directors' position still more difficult. On the eve of the adjourned Meeting they showed it to the Liverpool deputation—who, needless to say, thought it quite conclusive—but decided to withhold it and Wood's preliminary statement from the Proprietors until the latter's full report was available. The Meeting on the 10th of October at Bristol consequently passed off fairly peaceably, the opposition ultimately withdrawing their amendment to the Half-yearly Report, which was adopted unanimously, and the Directors promising to publish the Engineers' reports when both had been received and to call a Special Meeting to consider them and decide on future action.

Wood's report being still delayed, Brunel drew up a reply to Hawkshaw. To the latter's main objection to the exceptional gauge, he answers:

The question of the disadvantage of differing in point of gauge from other railways, and the consequent exclusion from com-

¹ Events have shown that Hawkshaw was absolutely right in his views except as regards the engines.

munication with them, is the first. This is undoubtedly an inconvenience; it amounts to a prohibition to almost any railway running northward from London, as they must all more or less depend for their supply upon other lines or districts where railways exist and with which they must hope to be connected. In such cases there is no alternative.

The Great Western Railway, however, broke ground in an entirely new district, in which railways were unknown. At present it commands this district, and has already sent forth branches which embrace nearly all that can belong to it; and it will be the fault of the Company if it does not effectually and permanently secure to itself the whole trade of this portion of England with that of South Wales and the south of Ireland; not by a forced monopoly, which could never long resist the wants of the public, but by such attention to these wants as shall render competition unnecessary and hopeless. Such is the position of the Great Western Railway. It could have no connection with any other of the main lines, and the principal branches likely to be made were well considered and almost formed part of the original plan; nor can these be dependent upon any existing lines for the traffic which they will bring to the main trunk.

The Great Western was therefore free to adopt its own dimensions; and none of the difficulties which would entirely prevent such a course in the north of England had any existence in the west. Consequently all the general arguments advanced and the comparisons made, on the supposition of such difficulties occurring—all excellent in case they did—are totally inapplicable to the particular case of the Great Western Railway, to which they have no reference whatever.

Such were Brunel's views in 1838; for a man gifted with such a lively imagination and so far-seeing in many ways, they seem to us to-day extraordinarily short-sighted. Elsewhere in the same report, he wrote:

Railway carriages and waggons must belong to the particular line on which they run; and, except in such cases as the Grand Junction and London and Birmingham Railways, which form in fact one line, although they happen to be made by two Companies. it will never pay to trust them in the hands of others.

In reply to Hawkshaw's economic objections to the increased capacity of the railway generally, Brunel urges

that higher speed and better accommodation will induce more people to travel, and so largely increase the Company's income, a point entirely overlooked by the critic. As to the engines, he answers with undeniable truth that "our best engines, which are considered so unnecessarily powerful, have been barely sufficient to take the loads which we were obliged to carry."

At last Wood's long delayed report was received on the 12th December. It was a very long document, extending in print to eighty-two octavo pages, and was to have been followed by a still longer appendix with details of the elaborate experiments made by Dr. Lardner on the Great Western, Grand Junction, London & Birmingham, Liverpool & Manchester, and Manchester, Bolton & Bury Railways to determine the amount of oscillation of the carriages on different forms of permanent way, the comparative power of the engines, and the effect of gradients, friction, and atmospheric resistance. The appendix, however, was not received until the whole controversy had been settled and so had no influence thereon.

Although he had made such a prolonged and extensive investigation of the matters referred to him, Wood was very chary of giving any unqualified judgements. On the most important point of all, the wide gauge, he dismisses Hawkshaw's chief objection, that it would prevent any junction with other lines, in a few words, "the Great Western Railway being complete in itself between the two sides of the island"; but confesses himself incapable of judging how far this may be affected by the branches. The objection that there are no advantages gained commensurate with the increased expense and the possible inconvenience of such isolation, he considers

substantially confirmed; but on the other hand, "must be allowed to say that there are counteracting advantages incidental to an increased width of gauge above that of 56 inches, which should not be overlooked." He sums up the matter in the same vacillating and indefinite way.

Almost all the results arising from these enquiries go to establish a conclusion that 7 feet is beyond that width which may be considered the best; but these investigations are far from conclusive in the present state of our information as to what other width is, under all the circumstances, the most advisable to be adopted. Under these circumstances and considering the great sacrifice of property which would result by the removal of the present rails and the substitution of any other width, it appears to me that such a step would not be justified by the result of these enquiries.

It is also necessary to state that the results elicited in the course of this enquiry show that considerable modifications may be beneficially made in both engines and carriages; and therefore until we have determined in the most satisfactory and conclusive manner the precise extent of the injury arising from the retention of the present width of gauge, and what width best affects all the objects required and which, under all the circumstances, is most conducive to the interests of the Company and affords the greatest accommodation to the public, it appears to me the present width should be retained.

This last paragraph alludes to the wretched results he, or rather Dr. Lardner, had obtained from their experiments with the Great Western engines. For example, the best of them, *North Star*, was found capable of taking 82 tons at 33 miles an hour, only 33 tons at 37 miles an hour, and 16 tons at 41 miles an hour; and to obtain this last additional speed of 4 miles an hour, the consumption of coke was increased from 1.25 to 2.76 lbs. per ton per mile. This phenomenon was ascribed by the learned Dr. Lardner to atmospheric resistance, increased by the

greater frontage of the wide carriages; and on the strength of his opinion Wood was actually led to conclude "that it is not advisable to attempt an extreme rate of speed, and that 35 miles an hour, with the existing engine power, may be considered as the limit of practical speed for passenger trains." Brunel and Gooch soon found it was due to quite another cause, and one easily remedied.

With regard to the permanent way, Wood does manage to make up his mind on one point: "that the piles do not contribute to the firmness of base of the railway; their action seems to prevent the contact of the timbers with the ground; and it is unquestionably proved that the passage of the engines and carriages along the rails contributes with a more powerful effect to consolidate the road and produce a greater firmness of bearing to the rails than the packing connected with the piles." He therefore had no hesitation in condemning the piles, and recommending that the scantling of the longitudinal timbers should be increased, as "the present timbers are much too small for the loads that come upon them and do not present a sufficiently rigid and unyielding base for a railway." They were only 5 to 6 inches thick, as we have seen. Continuous timber bearing of adequate strength, he considered superior to Stephenson's stone blocks, though somewhat more expensive, and both better than the cheaper cross sleepers of timber, "which cannot be considered as a permanent description of road."

Gibbs was not pleased with the report.

December 12th—I was a good deal troubled to-day by the great difficulty in which we are placed by the decidedly unfavourable tendency of Wood's Report. Our own conviction and Brunel's opinion and the weakness of Hawkshaw's reasoning all lead us to persevere in the wide gauge, when Wood's Report comes in,

founded on hasty and imperfect experiments, not absolutely opposing our gauge but tending to show that we should be better without it.

Matters came to a crisis in the next few days; the whole future of the Great Western was at stake, and Brunel's position as Engineer hung by a thread. Even Saunders and Gibbs were shaken in their support, and favoured the appointment of a second or consulting engineer. Russell alone stood firm.

December 14th—To-day an attempt was made from within to bring the Committee¹ to the conviction that it was necessary to associate another engineer with Brunel. It came on in this way. On the 12th the unfavourable report of Wood placed us in a very awkward position, and at that moment Dr. Squire's suggestion was received that we should call in Locke.²

I felt that under those circumstances, if the leading principles of the Railway could be previously settled, it might be shown to be necessary and not impracticable for the sake of peace to adopt some such plan as that suggested. Saunders was evidently very strongly of the same opinion.

To-day we learnt that Sims³ and Mills had last night been talking the matter over and that the former had gone to Brunel to say that he felt some change of the kind would be necessary, and we were told that Brunel himself was very much of the same opinion. Saunders, Casson, Russell, and myself argued the matter after the Board broke up, Saunders supporting the proposition and Casson doing so in much stronger language, Russell resisting it in a very sensible way, and I siding in the main with him because our position has been again altered by the receipt of another letter from Dr. Clarke.

We then repaired to Brunel's. He in a very modest way said that the evidence which was accumulating against him appeared to be too great to be resisted without injury to the Company, and therefore he was prepared to give way. He had no vanity of any kind. If it were necessary to yield, he had no objection to its

¹ The London Committee. The Bristol attitude will appear later.

² Joseph Locke, Engineer of the Grand Junction and London & Southampton Railways.

³ The Chairman.

being said that he had been defeated, for he felt confident in the correctness of his views and was sure that he should have opportunities of proving it. He spoke of the leading principles, for in other matters there had been errors and imperfections on our line as well as on others; but if it was proposed to connect another engineer with him, he could not see how such a scheme could possibly work, for which he gave his reasons, nor could he understand the meaning of a consulting engineer.

He gave us clearly to understand that he could not and would not submit to either of these alternatives, but that he would resign his situation as engineer whenever we pleased.

With respect to Wood's Report, he is perfectly convinced that a great fallacy pervades it, as may be shown and proved by experiment, and he proposed to devote all his mind and energies to show this in the next three weeks.

December 17th—I went to Paddington in the evening, and after the business was over the Chairman and Saunders talked to me about the proposal of Dr. Squire that we should admit Locke as co-engineer with Brunel. They advocated this measure and I resisted it.

December 18th—Met in Princes Street at 12. Ricketts joined us with Fripp¹ and Brunel and we had a long talk till nearly 5. Brunel laid before us his remarks on Wood's Report and gave us great reason to hope that by Saturday next he should be able to prove that our engines could perform nearly double what Wood supposes, and that he is quite mistaken in attaching so much importance to atmospheric resistance.

After this we discussed Dr. Squire's proposal. Fripp, Russell and I stoutly resisted the scheme, and I exerted myself to show its danger, the injustice we should be doing Brunel, and the hopelessness of our attaining peace by that means. It was at last settled that we should propose to appoint an engineer to whom to refer any new plans or experiments Brunel may suggest, and that if they² would give up the idea of Liverpool Directors we would appoint in February two out of six London men to be named by them.

The Bristol Committee seem to have been thoroughly frightened by the opposition and to have quite lost confidence in their Engineer. They were not satisfied with this decision of their London colleagues, so the full Board

¹ Both members of the Bristol Committee.

² The Opposition.

was summoned to meet immediately after Christmas. Gibbs records what passed as follows:

December 27th—Attended a Board at the Railway Office at 12, and having first heard and much approved the first part of Brunel's answer to Wood, we discussed the painful subject of our present position, and I was very sorry to hear that most of the Bristol gentlemen were in favour of concession.

Bright¹ judiciously suggested that these were points which would be better considered after the result of the Meeting had shown us how we really stood, and I urged at some length all the reasons which weighed with me against any concession. Upon the whole I was much disgusted with the view of the subject taken by our Bristol colleagues.

The Deputy Chairman's suggestion was adopted, and the matter left till after the Special Meeting, which, owing to the late arrival of Wood's report, had been adjourned from the 20th December, the date originally fixed, to the 9th January 1839, to give the Shareholders time to consider Wood's and Hawkshaw's reports, which were printed and circulated together with Brunel's replies.

In the meantime Brunel was at work to prove that Wood and Lardner were wrong in attributing the dismal failure of *North Star* to draw more than 16 tons at 40 miles an hour to atmospheric resistance, and thence arguing that high speed, one of the main objects of the wide gauge, was impracticable. He and Gooch were not long in finding that by increasing the size of the engine's blast-pipe, and at the same time taking care that the steam was discharged up the middle of the chimney, the power was greatly increased and the consumption of coke lessened. By this simple alteration they succeeded before Christmas in making her take 40 tons at 40 miles an hour, using less than a third of the quantity of coke.

¹ Chairman of the Bristol Committee and Deputy Chairman of the Company.

On the 29th December *North Star* took an experimental train with the Directors and a load of 43 tons to Maidenhead and back at an average speed of 38 miles an hour, the maximum being 45, consuming only .95 of a lb. of coke per net ton per mile, instead of 2.76 lbs., the quantity required for a load of 16 tons when Wood made his experiments in September. This fact demolished Wood's arguments, founded on Dr. Lardner's theories of atmospheric resistance, against the practicability of high speed, and inferentially against the wide gauge. Brunel was not slow to point this out and make the most of it in his printed reply to Wood's report, in which he also casts considerable doubt on the suitability and accuracy of Dr. Lardner's instruments for measuring resistances and oscillation, and expresses regret that the experiments were not made by Wood himself with his practical, as distinguished from theoretical, knowledge of the subject.

About this time the rest of the engines seem to have become less efficient than ever, and poor young Gooch, who was in no possible way accountable for either their design or defects, came in for the blame. Gibbs writes on 26th December, "Our engines are in very bad order, and Gooch seems to be very unfit for the superintendence of that department"! Two days later he is much worried by "the total unfitness of Gooch for his situation"! He must soon have changed his mind or found himself in a minority, for little more than a month later we find the Board sanctioning specifications and drawings for a large number of new engines, which Gooch had been directed to design quite independently of Brunel, his official superior.

The Special Meeting, which was to decide the question

of the gauge and, consequently, the whole future policy of the Company, assembled at the London Tavern in Bishopsgate Street on Wednesday, the 9th January 1839. The Directors' Report consisted of short comments on the reports of the Engineers, which had been in the hands of the shareholders for a week, and a statement of the policy they recommended. Hawkshaw's advice is scouted in the following passage :

Naturally expecting to find in his Report a clear and definite statement of the positive loss or disadvantages accruing from the increased width of gauge, the Directors could not fail to remark with some surprise that he enforces his recommendation, not upon any ascertained injury or failure in the plan, but almost exclusively upon the presumption that all railways, however disconnected or locally situated, should be constructed of one uniform width.

The objection that the wide gauge might prevent a junction with other lines seems both to Mr. Wood and the Directors to have but little weight, as applied to the Great Western Railway. Already has the same width been contemplated and provided for in the extension lines through Gloucestershire to Cheltenham, and from Bristol to Exeter. Any local branches hereafter to be made would undoubtedly follow the same course, and the Proprietors therefore may be satisfied that no apprehension need be entertained by them on that head.

Wood's atmospheric arguments are shown to have been already upset by the performance of the altered *North Star*, and the importance of this "in almost every relation of the inquiry" is emphasised. As to future policy—

The Directors, upon a deliberate reconsideration of all the circumstances affecting the permanent welfare of the undertaking, divesting the question of all personal partialities or obstinate adherence to a system, unanimously acquiesce in the abandonment of the piles, in the substitution of a greater scantling of timber, and of a heavier rail, retaining the width of gauge with the continuous timber bearings, as the most conducive to the general interests of the Company.

The Report having been read, it was moved and seconded:

That this Report be approved and adopted: and that this Meeting, being deeply sensible of the disastrous consequences inevitably arising from the continual discussion of the principles acted upon in carrying on the Works, do request the Directors to adhere to the principles laid down in their Report, as the most conducive to the permanent welfare of the Proprietors.

Whereupon an Amendment was proposed and seconded by the opposition party:

That the Reports of Messrs. Wood and Hawkshaw contain sufficient evidence that the plans of construction pursued by Mr. Brunel are injudicious, expensive, and ineffectual for their professed objects, and therefore ought not to be proceeded in.

After much discussion, in which, according to Gibbs, "our opponents made a wretched display," a show of hands on the amendment appeared decidedly in favour of the Directors, and a poll was demanded. The result was declared next day.

Votes against the Amendment:

Present	.	.	.	.	1,984	
Proxies	.	.	.	.	5,808	
						——— Total 7,792

Votes for the Amendment:

Present	.	.	.	.	176	
Proxies	.	.	.	.	5,969	
						——— Total 6,145

Majority against the Amendment 1,647

The original motion was then put and carried unanimously, and the Directors withdrew in triumph with the "warm and cordial thanks of the Meeting for the zealous

attention they have uniformly paid to the interests of the Proprietors."

Thus, for good or ill, was Brunel's 7 foot gauge established on the Great Western Railway, and in consequence on other railways as yet unknown.

The opposition loyally accepted their defeat and gave no more trouble. Though all talk of concessions to them was soon dropped, at the Half-yearly Meeting in February they, writes Gibbs, "treated us with respect and showed a disposition to co-operate with us cheerfully. This was very gratifying, particularly to me, as it showed that by firmness we had secured their respect, kept them out of the Direction, retained our Engineer, and preserved our gauge."

CHAPTER IV

CONSTRUCTION

1. *Maidenhead to Twyford.*

Maidenhead Bridge and its critics—Brunel's triumph—Heavier rails—Opening to Twyford—Goods Traffic and Third Class Passengers.

2. *Twyford to Reading.*

Sonning Cutting—One-sided Stations—Gooch's First Engine—Opening to Reading.

3. *Reading to Steventon and Faringdon Road.*

Basildon and Moulsoford Bridges.

4. *Bristol to Bath.*

Seven Tunnels—Litigious Contractors—Works delayed by Floods—Night and Day Work—Skew Bridge at Bath—Engines—Opening Trains.

5. *Faringdon Road to Hay Lane.*

The First Accident—Board of Trade Inspection—Level Crossings—Wootton Bassett Road Station—A New Town to be founded—Subsidised Coaches—Bad Roads.

6. *Hay Lane to Chippenham.*

A Slippery Embankment—Wootton Bassett Incline—Swindon Junction.

7. *Chippenham to Bath.*

Heavy Works—Box Tunnel—Its Contractors and Progress—Opening—A Narrow Escape—Lighting the Tunnel—Dr. Buckland's Attack—River Bridges—Bath Station—Bristol Terminus—Coke Ovens—Junction with the Bristol & Exeter Railway.

1. MAIDENHEAD TO TWYFORD

THE station called Maidenhead, though situated east of the Thames at Taplow a long mile from the town, was for more than a year the terminus of the Great Western Railway. Although the Directors resolved

early in August 1838 to move it a mile westward as soon as the line had been extended, it remained the only main line station for both Maidenhead¹ and Taplow till November 1871, when a new Maidenhead station $1\frac{1}{2}$ miles to the west was opened.

A quarter of a mile beyond was Brunel's famous bridge over the Thames, which excited much heated controversy during its erection. The river at this point is not quite 100 yards wide between low banks with a small shoal in the middle. Brunel designed a brick bridge of two of the flattest and largest arches that have, or at any rate had, ever been constructed in brickwork. Each arch had a span of 128 feet with a rise of only $24\frac{1}{4}$ feet, the centre pier being placed on the shoal. Four semi-circular arches at each end to provide for floods, one of 21 and three of 28 feet span, completed the structure. Work was begun early in 1837 by the contractor, one Chadwick, and before the end of the year the arches had been turned. In February 1838 the Directors reported that the bridge was in a very forward state and the centering would shortly be eased. It was eased in the course of the spring, and to the delight of the critics, who had all along declared that such flat arches could not possibly stand, the eastern arch soon showed signs of distortion. The western arch, however, annoyed them by standing perfect. In June Brunel reported:

The Contractor is now anxious to remove the centerings, as he feels confident that the arches have reached their maximum

¹ A small station entitled first "Maidenhead (Wycombe Branch)" and later "Maidenhead (Boyne Hill)" was opened with the branch in 1854 about a $\frac{1}{4}$ mile from the junction, close to the town but of course only served by the few branch trains. It was closed on the opening of the new main line station in 1871.

settlement, and proposes to remove and alter the external surface only of the distorted part, and thus prevent its being apparent to the eye. To this I have objected. I cannot say that I think the work unsafe, or that the Bridge would not stand very well in its present state, but the defect has been caused entirely by the fault of the Contractor, and while the centerings are in place he has still the means of removing this defective portion, and rendering the eastern arch as perfect as the western now is, and such as he contracted to make it. I propose therefore to direct Mr. Chadwick to tighten up the centres of both arches and to remove and replace so much of the eastern arch as upon close examination during the progress of this work I may consider defective, but it would be more convenient to us that he should postpone this operation for a time, until we shall have completed so much of the embankment to the west as will enable Mr. Oldham¹ to meet it within the required time, and we can then remove entirely our temporary roads which would interfere with the works of the Bridge.

Earth was being brought from the Bucks side by these temporary roads to form the embankment immediately west of the bridge.

The distortion of the eastern arch, about which so much fuss was made, consisted of a separation of about half an inch between the lowest three courses of bricks for about twelve feet on each side of the crown of the arch. It was caused by the centering having been eased before the cement had properly set, and was worse at the two faces than in the interior. In July the contractor admitted that he alone was to blame and, as soon as the earth tipping was finished, set about replacing the defective part. At this time the attack of the Liverpool opposition party on Brunel and the Directors was at its height, and the apparently insecure state of the bridge was of course used as a weapon. Hence it formed one of the matters on which Wood and Hawkshaw were asked to report. The latter considered that more weight was

¹ Contractor for the adjoining section westward.

required on the crown of the arch and accordingly recommended that some thirty feet of brickwork should be replaced by stone. Wood, on his part, found that the trouble was due merely to the cement not having had time to set and concurred in the remedy proposed by Brunel.

The necessary rebuilding was done and Gibbs records that the centres were eased on the 8th October. They



MAIDENHEAD BRIDGE

were, however, left in position, and the critics continued to declare that the bridge would fall down as soon as they were removed. Brunel had ordered that they should not be taken away till another winter had passed, but one night in the autumn of 1839 a violent storm blew them down. To the confusion of the critics and the triumph of the Engineer, the arches stood for all to see, and, needless to say, have been standing ever since. As a matter of fact, they had been quite clear of all support since the spring.

Westward from the bridge as far as Twyford, the works, for the most part a series of cuttings, were so far

finished by February 1839 as to admit of the ballasting being proceeded with. For the permanent way Brunel



SECTION OF 62 LB.
BRIDGE RAIL

decided to use bridge rails weighing 62 lbs. to the yard, 19 lbs. heavier than those east of Maidenhead, on longitudinal timbers 14 inches wide by 7 deep, with transoms and strap bolts, but of course no piles. The bulk of the piles between London and Maidenhead had already been cut off from the transoms and abandoned, but the light rails and timbers remained for some years. The remaining stock of these light rails was got rid of at once. In February 1839 the sale of 500 tons of them to the Dutch Consul-General was sanctioned by the Board, and early in the following month all the remainder was ordered to be disposed of.

Materials having become much cheaper, the relaying of the road between London and Maidenhead was begun in 1843. Timbers 14 by 7 inches, as on the rest of the line, and rails weighing 75 lbs. to the yard, 13 lbs. heavier, were used, making this stretch better instead of worse than the rest. The work was finished in 1846 and cost £97,266.

The permanent way being at last finished, and a temporary wooden terminus erected, the $8\frac{1}{4}$ miles between Maidenhead and Twyford were opened for traffic on the 1st July 1839.

At the same time the classes of passengers were reduced to two. At the opening to Maidenhead there were four sets of fares—posting carriage, first-class coach, second-class coach, and second-class open carriage. The booking of single passengers for posting carriages was very soon dropped, and these were

kept as saloons for special parties. Now second-class coaches were discontinued, and people who would not pay first-class fares had to be content with carriages roofed indeed, but with sides and doors only about three feet high, the rest being open to the weather. Needless to say, even these were vastly superior to the outside of a stage-coach, to which they corresponded.

Giving evidence before a Parliamentary Committee later in this same July, Saunders said the change had been



TWYFORD STATION, *c.* 1850

made to lighten the trains, but it can scarcely be doubted that another weighty reason was to induce more people to go first-class. Questioned as to a third class of passengers, he replied that perhaps the Company would arrange to convey "the very lowest orders of passengers" later on, but as yet no decision had been come to. Probably such people would eventually be taken once a day at very slow speed in carriages of an inferior description at a very low price, perhaps at night.

Goods traffic was begun in a small way in September, chiefly, it appears, through the agency of carriers, and

these carriers soon began to take along with the goods that low class of passenger traffic which the Company so despised. One of them, Dibbin by name, told a Select Committee of the Commons, in February 1840, that he was carrying by the Great Western Railway, at a fare of 3s. 6d. each, "persons in the lower stations of life" going on with the goods in his waggons from Twyford. So, indirectly and by sufferance only, third-class passenger traffic on the Great Western began.

2. TWYFORD TO READING

West of Twyford the great cutting through Sonning Hill was a source of much trouble and delay. Originally, as we have seen, Brunel intended to carry the line somewhat more to the north with a tunnel, five-eighths of a mile long, under Holme Park. He soon changed his mind and decided on a slight deviation and an open cutting. A short tunnel at the deepest part seems still to have been intended, for on the 30th August 1838, more than a year after the substitution of a cutting had been announced, and the Act for the deviation obtained, Gibbs records in his Diary that the Directors had that day determined to substitute a bridge—doubtless that carrying the Bath Road—for the tunnel at Sonning Cutting.

The cutting, nearly two miles long and of a maximum depth of sixty feet, formed part of the Ruscombe-Reading contract taken by W. Ranger, and as early as February 1838 it was clear to the Directors that, though the work was proceeding steadily, he would not finish the excavation by the time appointed. Matters got worse during the spring, and at last, early in August, the Committee was obliged to take the work out of his hands, as we shall see

the Bristol Committee had already done at their end of the line. Ranger then began proceedings in Chancery against the Company, which were destined to drag on for nearly twenty years.

The works were eventually sublet in three portions, and on the 8th October Gibbs notes :

At Sonning two of the Contractors were doing well, but the workmen have struck at the western end, and we had to threaten Knowles that we should instantly take the contract from him unless things were placed immediately in a more satisfactory condition.

Evidently the threat had no effect, for within a week Knowles was dismissed, and work resumed under the Company's Engineers. In February 1839 the Directors reported :

The works at Sonning have been much retarded by the condition in which they were left by the late Contractor, and by the consequent difficulty of subletting them to sufficiently responsible persons in that state, especially in the winter season. This applies more particularly to the west end of that cutting. In the centre of the hill, which had not been commenced, the sub-contractor has steadily performed his engagement, and very considerable progress has been made. The Directors, finding that the only security for getting the earthwork completed in the course of the summer would be by taking it into their own hands, have done so, and are prosecuting the work with the utmost vigour to attain that object.

By the last return from the Resident Engineer, 1,220 men and 196 horses were employed on the Sonning Cutting, and the Company have purchased two locomotive engines to give the required assistance to the work. There are still 700,000 cube yards of earth to remove ; and the quantity excavated and carried away by the above mentioned force exceeded 24,500 cube yards in the week. This quantity will be easily increased to 35,000 cube yards weekly when the locomotive power is brought into operation, and this will be in about a fortnight.

In the following August 145,000 cubic yards still remained to be excavated ; these were finished by the end of the year.

Two bridges cross the cutting at its deepest part. Of these, the western, carrying the main road, is a brick bridge, 60 feet high, of three arches; the other, for a by-road, Brunel built of timber in the style which he afterwards adopted for some of his viaducts.¹ Between the end of the cutting and Reading Station the River Kennet was crossed by a brick arch of 60 feet span, with four 18 feet side arches.



SONNING CUTTING

Reading Station itself was the first—and was destined to be the last survivor—of the quaint one-sided stations which Brunel designed for certain towns lying wholly or mainly on one side of the railway; this happened in each case to be the south. The Up and Down platforms were practically separate stations, side by side a short distance apart on the south or Down side of the main lines, each on its separate loop, the Up station being the nearer

¹ It was replaced by an iron bridge on brick piers when the line was widened in 1893.

to London.¹ The advantages of this plan were that passengers had not to cross the rails, and that non-stopping trains ran by clear of the station; while the disadvantages were that Up stopping trains crossed the Down main line twice, and also crossed the Down platform loop in entering the Up station, so that only one train either way could be admitted at a time, and no Down train could pass while an Up train was coming in.

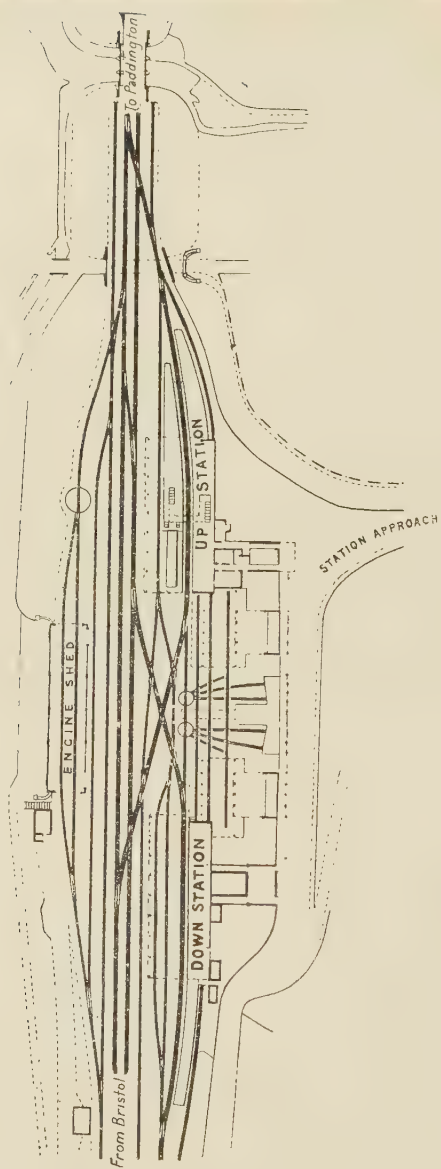


THE UP STATION, READING, *c.* 1850

(The roof of the Down Station may be seen in the background and the Engine Shed on the right)

Some practical minds among the London Directors seem to have foreseen the inconvenience of this, for early in March 1839 the Engineer was directed "to submit another plan for Reading Station with sheds on either side," but a week later they appear to have given way

¹ The Down station originally had a roof exactly similar to that of the Up station, but on the night of the 12th October 1853 the open flap of a waggon in a goods train from Basingstoke cut away some of the pillars and caused its collapse. It was never reinstated, a "temporary" shed roof being erected to cover the platform only. This did duty till the new station was built, more than forty years later.



PLAN OF READING STATION, c. 1850

and the original plan was approved. Two years afterwards Brunel told a Parliamentary Committee: "Nothing but experience could determine whether a one-sided station was more safe or more dangerous than an ordinary station; but it is a very convenient arrangement, it gives great accommodation to passengers." Two or three years' experience at Reading and Slough evidently proved satisfactory, to the Engineer at any rate, and similar one-sided stations were established at Taunton, Exeter, and Gloucester.

The permanent way from Twyford to Reading, of the same construction as that between Maidenhead and Twyford, was laid by contract, and was ready in time for an engine with some of the Directors to run to Reading on the 14th March 1840.

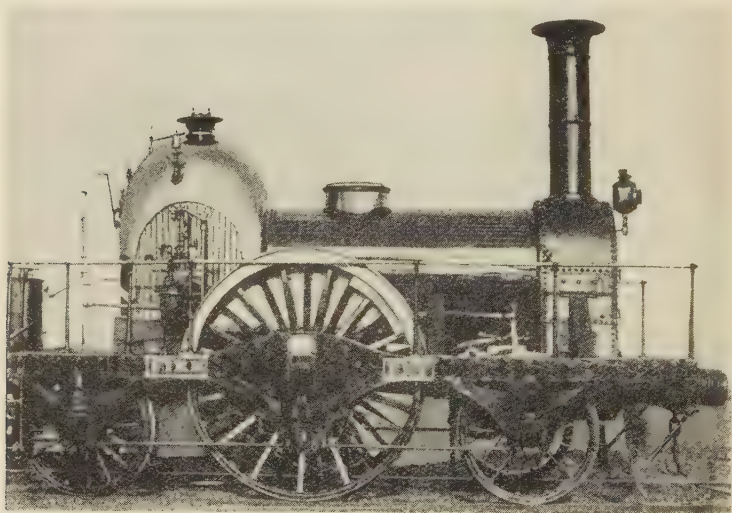
A fortnight later the first Great Western engine designed by Gooch, a 7 foot single named *Firefly*, which had been opportunely delivered on the 12th March and made a successful trial trip on the 17th, took a train of two carriages and a truck with Directors and others to the number of about 40 from Paddington to Reading, $35\frac{3}{4}$ miles, in 45 minutes, and on the return journey covered the $30\frac{3}{4}$ miles from Twyford, where she stopped for water, in 37 minutes, at an average speed of 50 miles an hour with a maximum of 58.¹

On Monday, 30th March 1840, the railway to Reading was opened for public traffic.

From this time onwards to the end of 1842 Gooch's engines were constantly being delivered by their various builders—three more came in April and six in May—and the trouble caused by the utter unreliability of almost all the original locomotives gradually passed away as they

¹ *London Courier*, 1st April 1840.

arrived. In Gooch's own words,¹ "We could now calculate with some certainty, not only upon the speed they could run, but also upon their not breaking down on the journey. We had no difficulty in running at sixty miles an hour with good loads." Previously breakdowns were of constant, almost daily, occurrence, and in January



GOOCH'S FIRST ENGINE

1840, when the Company possessed twenty-two engines, we find Brunel writing to Gooch: "We are to-day as badly off for engines as we have ever been."

3. READING TO STEVENTON AND FARINGDON ROAD

Reading did not long remain the terminus: indeed, it had not been intended to be a terminus at all. Up to the autumn of 1839 the intention was to open the whole

¹ Gooch's *Diaries*, p. 46.

32½ miles from Twyford to near Faringdon at once in the following spring, but the extraordinarily wet weather of the autumn and winter prevented this.

The contracts for the line as far as Didcot had been let early in 1838, that for the two bridges over the Thames being the first taken in February. Besides these, the chief works were the embankment west of Reading and several deep cuttings, among them that through Purley Park, where a long tunnel had been first contemplated. The Reading embankment was to have been formed with the earth from Sonning Cutting not required for the station and its approaches but, owing to the delay of the contractor there, much of it had to be made by side-cutting. By the end of August 1839 most of the work, including the river bridge at Basildon, had been finished, while the Moulsoford Bridge and the line east of Pangbourne were expected to be ready by Christmas. These two bridges are very much alike, each consisting of four 62 foot arches of red brick, with Bath stone facings. West of Didcot, as far as Uffington, the contracts were let in March, and this comparatively light work was proceeding rapidly.

In February 1840 Brunel reported :

Beyond Reading and up to Didcot, a distance of 17½ miles, the ballasting is completed with the exception of two short lengths, together about 2½ miles. The difficulty of procuring ballast for this part has been very great; the ground purchased for this purpose being under water, and it being necessary to resort to dredging the river to obtain gravel. The laying of the permanent rails is in a forward state, a single line being laid for 15 miles, upon which the materials for the second line are carried and distributed at all parts so that this work will proceed rapidly.

Beyond Didcot, great exertions had been made to complete the line for opening to a point near Faringdon simultaneously with the opening to Reading, and there can be no doubt that this might have been accomplished during May, probably even in

April, had the season permitted it. A few weeks will complete the earth-work, and preparations are making for ballasting. If no further delays should now occur from the indirect consequences of the late wet season, the opening to Faringdon may be calculated upon in June or the beginning of July; but although the embankments and cuttings are very slight in this part of the line, they will require dry weather before they can be ballasted. The further opening to Swindon will also necessarily have been delayed, but may still be looked for in the course of this year.



BASILDON BRIDGE

The $20\frac{1}{2}$ miles from Reading to Steventon, with intermediate stations at Pangbourne, Goring, and Wallingford Road,¹ were opened to the public on Monday the 1st June 1840. Steventon of course meant Oxford, only 10 miles off on a main turnpike road, and for four years it remained, by means of a frequent service of coaches and waggons, the Oxford Railway Station. Even to this

¹ This station was immediately west of the bridge over the Thames and on the main Reading Wallingford road. On the opening of the Wallingford Branch in 1866 it was renamed Moulsoford, and in 1892 superseded by a new station called Cholsey and Moulsoford $\frac{3}{4}$ mile farther west. Didcot was opened in 1844, and Tilehurst in 1882.

day it is used as such by the Post Office for a considerable portion of the night mails.

Seven weeks later, on the 20th July, the line was extended a further $7\frac{1}{4}$ miles to Faringdon Road Station,¹ some 5 miles from the little Berkshire town, and on a direct road to Cirencester, Gloucester, and Cheltenham.



PANGBOURNE STATION

Neither of these two openings had much effect on the Bath and Bristol traffic; the coaches continued to use their old London road and connect with the trains at Reading.

4. BRISTOL TO BATH

The works on this section were some of the heaviest on the line. The terminus at Temple Meads was to be built on arches 15 feet above the level of the ground, and in the

¹ Renamed Challow in 1864 on the opening of the branch to Faringdon. Wantage Road was opened in 1846.

first mile were bridges over the Floating Harbour, formed out of the original course of the Avon, a canal known as the Feeder, bringing water from the river at Netham to the same harbour, and the Avon itself. Then came at short intervals three tunnels through rock, respectively 326, 154, and 1017 yards long, and officially known as Nos. 1, 2, and 3. For part of the way between No. 2 and No. 3 the railway was to be carried on a narrow shelf between the rocky hillside and the river, supported by a massive retaining wall, and eastward of No. 3 Tunnel the river had to be diverted for a short distance to the extent of half its breadth to form a similar shelf below a steep wood known then and now from its owner's name as Fox's Wood. East of Fox's Wood were two more short tunnels¹ and a deep cutting, soon followed by a long embankment across the low-lying Keynsham Hams. Two miles farther on at Saltford another tunnel of 176 yards and a deep cutting had to be made, and then nearly 2 miles of high embankment across the riverside meadows to an iron skew bridge carrying the Bath turnpike road, which is immediately succeeded by the short Newton Cutting, where the tessellated pavement of a Roman villa, long preserved at Keynsham Station, was unearthed. Twerton Tunnel, 264 yards long, comes next, followed by a walled cutting, and then the Twerton Viaduct of 28 arches. Bath Station was approached by another viaduct of 73 arches, two of them crossing diverging main roads, and a skew bridge over the Avon. This station was also to be built on arches somewhat higher than at Bristol between two bridges over the river.

Preliminary operations were begun in September 1835,

¹ 53 and 37 yards long respectively; both had been opened out by 1894.

immediately after the passing of the Act, by Brunel and his assistant, G. E. Frere, whom he installed as Resident Engineer for the Bristol Division of the line with a staff of five engineers under him. During the autumn and winter most of the land was bought or agreed for, and in March 1836 the first contract, comprising the Avon Bridge at Bristol and the three tunnels, was let by the Bristol Committee of the Board to William Ranger. Other contracts had been let by August, when the Directors reported that work had been begun at all the principal points. A year later considerable progress had been made; the Keynsham embankment was finished, as well as much of the Brislington Tunnel (No. 3) to its full dimensions, and the Avon Bridge, which had been delayed for some reason, was proceeding satisfactorily. Near Bath, difficulties in obtaining possession of the land had prevented anything being done, but these were overcome in August and the works begun. By this time the fond hope of opening the line in the spring of 1838, which had been expressed by the Committee as late as February 1837, had been abandoned. Brunel was having great trouble with Ranger, the contractor for the Bristol end of the line, who seems to have been quite unequal to the task he had undertaken, lacking both capital and energy. Having already relieved him from part of his engagements, to enable him to concentrate his resources on the remainder, without much result, the Directors were obliged in the spring of 1838 to get rid of him altogether and take possession of the works. The three tunnels were then taken in hand by the Company's Engineers, the work being sublet in small portions, and the remainder of Ranger's contracts let to a more competent man, David McIntosh, who was also employed in

the London Division. These two contractors, Ranger and McIntosh, afterwards distinguished themselves from the rest by Chancery proceedings against the Company of the Jarndyce *v.* Jarndyce order, which dragged on till 1855 and 1866 respectively.

Ranger's failure and other lesser troubles caused great delay, with the result that not till August 1839 were the Directors able to report much definite progress. Of the tunnels, No. 1, Saltford, and Twerton had been finished ;



Photo 1887

AVON BRIDGE, BRISTOL

No. 2 would be finished in three weeks, and No. 3, the longest and most difficult, in about two months. The Harbour Bridge had been much delayed, first by difficulty with the foundations, and secondly by bad work put in by the former contractor, which had to be almost entirely renewed. It was a stone bridge, slightly askew, of two main arches each of 56 feet span with two smaller side arches, the centerings for which were then about to be erected. Beyond this, the viaduct and embankment were nearly finished, and the Feeder Bridge, which for some reason was made of timber,¹ was rapidly proceeding. The

¹ Replaced by iron 1879.



NO. 1 TUNNEL—WEST END



NO. 1 TUNNEL—EAST END

big Gothic arch of 100 feet span over the Avon and its two side arches had been completed for some time and the centerings lowered. Eastward from the long tunnel to the turnpike road at Newton St. Loe, nine miles from Bristol, most of the line was nearly ready for the permanent way, and from this point onwards to "the entrance to Bath" little or nothing remained to be done. The iron skew bridge under the said turnpike road, which had been long hindered by difficulties with the Bath Road Trustees, had just been begun and would be finished in a few weeks. At Bath matters were very much in arrear; neither the bridge over the river nor the station had yet been begun. On the whole, however, the Directors considered that most of the works would be completed during the autumn and a great part of the permanent way laid, for which a contract had already been let, so that they would be able to open the line from Bristol to Bath early in the spring of 1840.

They were again disappointed, this time by the very wet winter and consequent floods in the Avon. In February Brunel reported:

At the Bristol extremity the floods in the Avon have interfered with the supply of building materials; and at Bath and in its immediate neighbourhood the unprecedented continuation of a state of flood in the river for a long period and till within the last few days has rendered it impossible to carry on the works of the Bridges or even of the Station, the site of which has been flooded. Such a complete suspension of the works at some points and such delays at others have resulted from these and other causes indirectly consequent upon them that certainly not less than four months additional time will be required for the completion of some of these works, the whole of which would otherwise have been finished within a month or two of the present time, which must delay the opening to the end of the summer instead of the spring.

The works of the Station at Bristol, including the viaduct and offices, are rapidly advancing; but at Bath the causes I have

■

referred to have prevented till within the last few days anything more than the commencement of the approaches.

Between these two extremities all the principal works—the Tunnelling, Cutting, and Embankments—are so far completed that, had the weather permitted it, the ballasting and permanent way would have been by this time in a very forward state. The excavation of the Tunnels is everywhere opened throughout, and the only work remaining to be done to them consists of the formation of the permanent drains and the finishing of detached parts of masonry, which in the general progress of the work had been injured or condemned, and the completion of one of the tunnel fronts. A few weeks will complete everything but the permanent rails, but many parts of the line, long since prepared, have not been in a state to allow of men or horses passing over them without destroying that portion of the forming which the rains had allowed to be completed, so that not more than $2\frac{1}{2}$ miles of ballasting have been actually finished.

The tunnel front alluded to—the west end of No. 2 Tunnel—remained unfinished till the end of the century. The continued wet of the winter brought down a portion of the hillside, and so made its completion and an intended retaining wall unnecessary. Struck by the resemblance of the unfinished masonry to a ruinous mediaeval gateway, Brunel then decided to leave it as it stood, and caused ivy to be planted to increase its picturesque effect. In this state it remained till 1900, when a less artistic successor completed it in the severely practical style of railway works of the present day.

Both Brunel and Stephenson built ornamental fronts to their tunnels, generally of the castellated kind. Those of the former between Bristol and Bath were of various imposing designs, several of which are illustrated. The east end of the long No. 3 Tunnel was distinguished from the rest by having no front, the rock being left in its rough state like the mouth of a cave. Being cut through hard rock, this tunnel was not lined with masonry like the others. In excavating No. 1 Tunnel two very large

specimens of the nodules often found in the sandstone were unearthed. These Brunel had set up on either side of the line near the east mouth; one of them is still to be seen at the end of the cutting there. Three shafts were used in boring No. 3 Tunnel, and no less than six smaller shafts were found necessary for purposes of ventilation to



NO. 2 TUNNEL—WEST END

carry off the fumes of the blasting powder, large fans being erected on top to create a draught. Five of these nine shafts remain open to-day. Even the comparatively short No. 1 required four ventilating shafts, all of which were afterwards filled up.¹

During the spring of 1840 great exertions were made to make up for lost time and get the line open, and in the

¹ No. 1 Tunnel was opened out in 1887-8.



NO. 3 TUNNEL WEST END

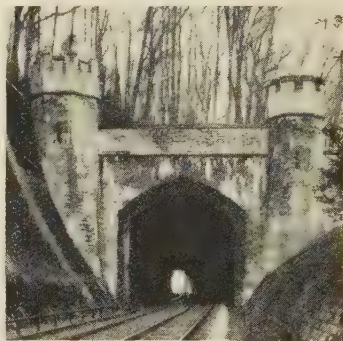


NO. 3 TUNNEL—EAST END

summer these were redoubled, relays of men being employed on the work, which went on continuously by night as well as by day and even, to the horror of the citizens of Bath, on Sundays. The skew bridge over the Avon was the work most of all in arrear. Brunel had intended it to be of iron, and tenders for 500 tons of ironwork were invited in May 1839, but, as the Directors reported in August, difficulties in letting by tender



TWERTON TUNNEL
WEST END



TWERTON TUNNEL
EAST END

occurred, which caused them to delay its beginning till they could make other arrangements. Eventually Brunel decided to make it of timber, perhaps with a view to getting it finished quickly. It is thus described in Bourne's *History of the Great Western Railway*.

The angle at which the Bridge crosses the River is so considerable that, although the space from quay to quay is only 80 feet, the space traversed by the railway is 164 feet. The bridge is of two arches, each of 80 feet span. Each arch is composed of six ribs placed about five feet apart and springing from the abutment and a central pier of masonry. Each rib is constructed of five horizontal layers of Memel timber held together by bolts and

iron straps. The end or butt of each rib is enclosed in a shoe or socket of cast iron, resting with the intervention of a plate upon the springing stones, the shoes on the middle pier being common to the two ribs. The spandrils of the four external ribs are filled up with an ornamental framework of cast iron supporting the parapets. The interior ribs are connected by cross struts and ties. The cornice and parapet are both of timber; the latter is



BATH SKEW BRIDGE

framed in open work of a lozenge pattern. The abutments are flanked by plain turretted piers, and the tow-path is carried on an iron gallery beneath the western arch.¹

At last the various works and the laying of the permanent way, which like all that west of Maidenhead consisted of 62 lb. bridge rails on longitudinal timbers, 14 inches by 7, were so far advanced as to enable the Directors to announce the public opening for the last day of August. Meantime, six of Gooch's new engines had

¹ It was replaced by an iron girder bridge in 1878.

arrived, two named *Arrow* and *Dart* respectively built at Bristol by the firm of Stothert, Slaughter & Co., the others, *Fireball*, *Spitfire*, *Lynx*, and *Meridian*, from North country builders.¹ The latter are said to have been delivered in parts by river and put together in Saltford Tunnel.

Frederick Clarke, a brother of the London Traffic Superintendent, was appointed to a similar position at Bristol on the 30th May 1840 in anticipation of the opening.

On the 21st August five members of the Bristol Committee, accompanied by Brunel and one or two other officers of the Company, made a trial trip to Bath. As the rails were not yet laid at the station and no carriage was available, they started from the engine house, some 600 yards up the line, on *Arrow* and reached Keynsham in ten minutes. There they changed on to *Meridian* and after a delay of eight minutes proceeded on the other line of rails, stopping at the Newton Turnpike Bridge to pick up Frere, the Resident Engineer, and reached the Bath Viaduct—it and the river bridge were still unfinished—in a quarter of an hour from Keynsham, or 33 minutes from Bristol with two stops, a result which hugely delighted the five Directors. After inspecting the bridge they returned to Bristol in about the same time, changing engines and lines at Keynsham.

No special ceremony, beyond the flying of flags and ringing of church bells, marked the public opening of the line, which took place, as announced, on Monday, 31st August 1840, and caused much excitement in the two cities and the intervening country. The first train was

¹ Some others came later; *Stag* is recorded to have killed a person at Keynsham on the 23rd September.

advertised to start from the unfinished terminus at Temple Meads at 8 a.m., and start it did, only a few minutes late, although the last rail into the station had not been well and truly laid more than half an hour. It was drawn by *Fireball*, gaily decorated with flags, and made up of three first-class and five second-class carriages filled by the general public, who had previously obtained "check tickets" in the large booking hall downstairs. The passengers, though much excited by the novel adventure and "the shouts of the multitude which lined the road," seem to have controlled themselves—no one is recorded even to have jumped off after his hat, a not unusual occurrence in those days—and after dashing through Nos. 1 and 2 Tunnels "in the twinkling of an eye," according to an enthusiastic reporter, and being somewhat terrified by the prolonged darkness and noise of No. 3, reached the only intermediate station at Keynsham in safety. Here a stop of three minutes was made, and then the train "swept on in an incredibly short time" into Bath, which was reached in 33 minutes from Bristol. The station here was in a still less finished state than at Temple Meads, but had evidently been built up to rail level and provided with platforms. The first train from Bath, due to leave at 9, started more than half an hour late and arrived at Bristol at 10.8. Ten trains were run each way during the day, four of them not stopping at Keynsham, carrying 5,880 passengers and earning £476, of which £231 was taken at Bath, £224 at Bristol, and £21 at Keynsham. This service continued till December, when another train each way was added and stations were opened at Saltford and Twerton.¹ No reference to

¹ St. Anne's Park was opened in 1898, and Twerton closed in 1917.

goods or third-class passengers was made in the announcements, either in August or December. Apparently this traffic was not provided for until the railway was opened throughout from London.

5. FARINGDON ROAD TO HAY LANE

For five months Faringdon Road Station, $63\frac{1}{2}$ miles from Paddington, was the terminus of the London Division, and there the first recorded accident occurred on the 25th October 1840. In the darkness of the early Sunday morning Brunel himself and one or two others, waiting for an engine to take them to London, saw the night goods train approaching at an unusual speed. In spite of their shouts and the efforts of the guard, who was in the open truck next the engine with four third-class passengers, the train rushed on unchecked through the station and the closed doors of the temporary engine shed beyond, which it demolished. The driver, who was seen standing motionless on the engine—*Fire King*—was killed, and four others, including the guard, injured. It seems he was fast asleep at his post, and we are left wondering how long the poor man had been on duty.

The contracts for the rest of the London Division, which extended to Shrivenham, and for the portion of the Bristol Division thence to Chippenham, were let in the spring of 1839, but, as elsewhere, the work was much delayed by the wet winter of that year. In the summer following, the Directors determined to open a section of $16\frac{1}{2}$ miles from Faringdon Road to a point between Swindon and Wootton Bassett, where the railway was within half a mile of the turnpike road between those

places, and where a by-road called Hay Lane crossed the former at the entrance of the long Studley Cutting, evidently not yet finished, 80 miles from Paddington.¹ Although there are no works of any special difficulty or importance on it, even this was not ready till December.

Meantime the Railway Regulation Act of 1840, commonly known as Lord Seymour's Act, had come into force, providing, amongst other things, that all new railways must be inspected and approved by "The Lords of the Committee of Her Majesty's Privy Council appointed for Trade and Foreign Plantations," called for short the Board of Trade, before being opened for the public conveyance of passengers. Accordingly Saunders gave the required notice of the intended opening to their Lordships, and their Inspector-General of Railways, Lieut.-Col. Sir Frederic Smith, R.E., came down early in December to inspect and report.

He found the embankments and cuttings finished off, except the central part of Marston Cutting, and most of the bridges complete or on the point of completion, save that under the Roman Ermin Street, near Stratton St. Margaret, the arch of which had not yet been turned. About a mile and a half of permanent way remained to be laid, and more ballast was required at several places. "The Signal Disks and Lamps, which are of a very satisfactory character on that part of the railway at present open to the Public, have not yet been put up on the new line."

There were three level crossings of public highways, and as to these a legal question arose. The Great Western Act of 1835, in common with other early Railway Acts,

¹ About the present 80 $\frac{1}{4}$ mile post.

provided that the gates should be kept shut across the railway and only opened to allow trains to pass. On the other hand, a public general Highway Act of 1839 provided that Railway Companies should maintain gates across each end of the road at such crossings, so that people passing along the road should not be exposed to danger from the trains. The point was whether the later general enactment by inference repealed the special one. At these crossings the Company had erected gates across the roads not wide enough to close across the railway in accordance with their own Act. Sir Frederic Smith, being a man of common sense, contented himself with drawing attention to the fact and approving what had been done, while at the same time suggesting that the road gates should be of such dimensions as to meet across the railway when open and so prevent trespassing. A year later the point was again raised by a letter from Saunders to the Board of Trade, to which the Board replied that they agreed with the Directors that keeping the gates shut across the railway was much more dangerous than keeping them shut across the highway, and that several fatal accidents had recently occurred in consequence of the former practice; they also considered that Parliament had intended the general Act to supersede all inconsistent private Acts. The supposed intention of Parliament being, however, of little importance in law, Saunders had a test case brought before a bench of magistrates by causing one of his crossing keepers to be summoned for not keeping the gates shut across the railway. The magistrates adopted the view of the Board of Trade, and dismissed the case. The doubt was eventually set at rest by the Railway Regulation Act of 1842.

As to the terminus at Hay Lane, officially entitled "Wootton Bassett Road" being nearly four miles by road from the little town, Sir Frederic remarked: "Although Hay Lane Station is merely intended as a temporary terminus, the Company are forming it, in regard to sidings, switches and other mechanical arrangements, in the same extensive and substantial manner as is their ordinary practice at permanent terminals."

Having received their Inspector's satisfactory report, the Board of Trade sanctioned the public opening as soon as his few requirements had been satisfied. This caused a delay of a day after that already advertised, and the extension to Wootton Bassett Road was eventually opened without any fuss on Thursday, the 17th December 1840, for all kinds of traffic. The only intermediate station was at Shrivenham,¹ such inhabitants of the market town of Swindon as wished to venture on the new railway having to betake themselves to Hay Lane, three good miles to the west, until such time as the junction station to be established within a mile of the town should be ready.

Two months before the opening of the railway the founding of a new town in the fields between it and Swindon had been foreshadowed, when the Great Western Directors, by the advice of Brunel, who with Gooch had been down on a special visit of inspection, resolved on the 6th October:

That the Principal Locomotive Station and Repairing Shops be established at or near the Junction with the Cheltenham and Great Western Union Railway at Swindon.

¹ Uffington was added in 1864.

The following letter from Gooch to Brunel shows the grounds on which this decision was based.

BRISTOL,
13th September 1840.

My dear Sir,

According to your wish I give you my views of the best site for our principal engine establishment, and in doing so I have studied the convenience of the Great Western Railway only, but also think the same point is the only place adapted for the Cheltenham and Great Western. The point I refer to is the Junction at Swindon of the two lines.

The only objection I see to Swindon is the bad supply of water. There is also an apparent inequality of distance or duty for the engines to work—but which is very much equalised when the circumstances attending it are taken into account. I find the actual distances are as $76\frac{1}{2}$ to 41 and the gradients are for the short distance of 41 miles a rise of 318 feet or 7.75 feet per mile, and for the $76\frac{1}{2}$ miles a rise of 292 feet or 3.8 feet per mile. Swindon being the point at which these gradients change, the different gradients necessarily require a different class of engine, requiring for the Bristol end a more powerful one than for the London end.

That power can only be obtained conveniently by reducing the diameter of the Driving Wheels, therefore, supposing we work between Swindon and Bristol with 6 feet wheels, and between Swindon and London with 7 feet wheels, there will actually be very little difference between the work required of the two engines, when the additional gradients and curves, and the increased number of revolutions per mile which the small wheeled engine makes are taken into account. It would also divide the pilot engines very nearly equally, as Reading being the first Station where a pilot engine would be kept, say 36 miles, the next distance, to Swindon, would then be 41 miles, and on to Bristol another 41, and which I think would be sufficiently near for pilot engines to be constantly ready, and with this arrangement the watering stations would work very well. Steventon, where plenty of water can be had, forming a central station between Reading and Swindon, and as our Oxford Traffic comes on there I should think it likely that all trains will stop there. A large station at Swindon would also enable us to keep our Bank engines for Wootton Bassett incline at Swindon instead of having a separate station for that purpose at the bottom of the incline, and in addition it would at any rate be necessary to have a

considerable Station at Swindon to work the Cheltenham line, which would be saved if Swindon was our principal station.

It has also the great advantage of being on the side of a canal communicating with the whole of England, and by which we could get coal and coke, I should think at a moderate price. I am not sufficiently acquainted with the place to know how far we would be affected by the want of water, it might probably be collected in the neighbourhood, and as we have a great deal of side cutting they might be converted into reservoirs, and should even this fail us we have the canal. These reasons lead me to think Swindon by far the best point we have for a Central Engine Station. From the plans and sections there appear little or no difficulties with the nature of the ground for building upon, and by placing the Station somewhere as shown in the enclosed sketch,¹ it might be made in every respect very complete. I have not thought of the Bristol and Exeter line in the arrangement, as it is quite possible to work it very well by engines kept at Bristol as long as they are fit for work. In the same way we could work the additional Bath traffic, for when necessary they could always work their way to Swindon when any heavy repairs were required. The Engine House we are building at Bristol would be ample for any slight repairs that might be required during the time the engine was in working order, and that without any outlay of machinery beyond a few hundred pounds. I am not aware of any difficulties connected with Swindon more than the water.

I am, my dear Sir,

Yours very truly,

DANIEL GOOCH.

I. K. Brunel, Esq.

Concurrently with the extension of the line to Wootton Bassett Road, the Directors arranged with the proprietors of the Bath and Bristol coaches to work them at a fixed mileage rate between that station and Bath in connection with the trains, carrying passengers and parcels booked through by the Company, and also made similar arrangements for the conveyance of goods. The Cheltenham and Gloucester traffic continued to and from

¹ The sketch plan shows an Engine Establishment of the round-house type in a triangle formed by the two railways and a western loop joining them.

Faringdon Road, owing to the bad state of the roads in the Wootton Bassett neighbourhood and the existing arrangements of the coach proprietors. In their August Report the Directors said with reference to this:

Although nearer in distance to Cheltenham, the country roads from Hay Lane to Cirencester were in such bad repair as to be almost impassable, and consequently the whole of that branch of traffic continued to join or leave the Railway at Faringdon Road.

The same cause very greatly affected the direct Bristol and Bath traffic, and prevented any material increase of income from the more remote or collateral trade. Indeed, if the Directors had not decided to take the Bath and Bristol Coaches into their own hands, under an agreement with the Coach Proprietors at the time they did, it would probably have been impossible to secure their running to Hay Lane while the roads for some miles from that Station were permitted to remain in the condition so much and so justly complained of by every passenger.

This state of things continued for nearly six months, until the railway was opened simultaneously to Chippenham and Cirencester.

6. HAY LANE TO CHIPPENHAM

The earthwork on the next section to be opened, from Hay Lane to Chippenham, was extensive; there were four cuttings of from 40 to 50 feet maximum depth and three embankments between 30 and 40 feet high, besides another $3\frac{3}{4}$ miles long though nowhere more than 20 feet high. Two of the latter near Wootton Bassett caused much difficulty and expense by constant slipping. As early as February 1840 Brunel scented trouble, and reported to the Board:

At Chippenham the works have proceeded well, but in the neighbourhood of Wootton Bassett such have been the effects of the weather that it is probable that time and expense might have been ultimately saved by totally suspending the works during the last autumn and winter.

The quantity of work done during this period has been so

limited that it would have required a few weeks only of summer weather to form the same extent of earthwork in a more substantial manner without incurring the same risk of future delays in the progress of the contracts from the slipping of earth excavated and thrown into embankment in a wet state. Arrangements are now making for redeeming as far as possible the time which has been lost, by prosecuting the works by the use of locomotive engines and other means with every possible vigour and despatch during the coming season.

Six months later he had resorted to side cutting, though this involved the purchase of extra land, "which has not only improved the quality of the earthwork, but has enabled me to expedite the final completion, and at the same time to perform the great bulk of the work during the Summer instead of the Winter months." In spite of all his efforts, the clay, of one of these banks especially, continued to slip till at last in the spring of 1841 he was obliged to adopt the expensive and laborious plan of driving several rows of large piles through the mass into the solid ground below and chaining opposite piles together with chain cables. Even this, though it enabled the line to be opened, did not entirely cure the slipping, which continued to give more or less trouble for many years.

A sudden small slip during the night of the 7th September 1841 in the western of the two embankments, that on the Wootton Bassett Incline, caused the derailment of the Up Mail train, consisting of three carriages drawn by two engines, *Rising Star* and *Tiger*. The former passed the slip in safety, but *Tiger* broke away from it and ran off the rails with the train, fortunately towards the Down line. Though all remained on their wheels, the first two carriages were badly damaged; one passenger had a leg broken, and three others as well as two servants of the Company were slightly injured.

The incline on which this accident occurred is the first of any importance on the line from London, and falls westward for 1 mile and 550 yards at 1 in 100. As far as Didcot the gradients, mostly rising, nowhere exceed 1 in 1320, or 4 feet in the mile; thence to the summit level at Swindon, 270 feet above Paddington and 292 above Bristol Station, they vary from 6 to 7 feet in the mile, with two short pieces at 8 feet or 1 in 660. From Swindon to the top of the incline and on from its foot to just



WOOTTON BASSETT INCLINE

beyond the bridge over the Avon at Christian Malford the line falls gradually at 8 feet per mile, to rise at the same rate thence to the east end of Box Tunnel.

As soon as these two embankments near Wootton Bassett had been made secure and the bridge over the Avon at Christian Malford finished, the $13\frac{3}{4}$ miles from Hay Lane to Chippenham were ready for public use, all the remaining works having been already completed. This section was accordingly opened on Monday, the 31st May 1841, having first been duly inspected by Sir Frederic Smith. On the arrival of the first train from

London, the Chairman and several Directors, with Brunel, the two Secretaries and other officers of the Company, were entertained at a public breakfast by the Mayor and certain inhabitants of Chippenham.

The station at Chippenham was not yet quite complete, according to the Inspector's Report, which notes also that "The temporary station at Hay Lane is to be abandoned as soon as the station-house and other buildings, which are now forming at Swindon, shall be completed."



CHIPPENHAM STATION, *c.* 1850

As the portion of the Cheltenham & Great Western Union Railway between Cirencester and Swindon was opened on this same 31st May, it is evident, notwithstanding the inference which might be drawn from these words, that the junction station at the latter place was already sufficiently formed to provide at any rate for the transfer of passengers. Indeed "Wootton Bassett Road" appears in the timetable of 14th June 1841 in addition to Swindon and was not abandoned till the new station at Wootton Bassett itself, more than $2\frac{1}{2}$ miles west of Hay Lane, was opened a month or two later.¹

¹ Dauntsey was opened in February 1868.

7. CHIPPENHAM TO BATH

The remaining section, from Chippenham to Bath, comprised the heaviest works on the whole line. On scarcely one of the thirteen miles were the rails within ten feet of the natural surface of the ground. A stone viaduct immediately west of the station is followed by a high embankment for more than two miles, and then come three miles of almost continuous deep cutting, with perpendicular sides for the last half mile, to the mouth of the great tunnel under Box Hill, not quite two miles long but then much the longest in the country. From the west end of the tunnel half a mile of embankment leads to a short tunnel, followed after a short interval by a cutting in the side of a hill and another long embankment for three miles to the village of Bathampton, with a bridge over the Avon at Bathford. Thence a cutting and embankment lead to the outskirts of Bath, where the Kennet & Avon Canal had to be diverted, a big retaining wall built, and two short tunnels under houses made. West of the second of these an embankment and viaduct, again crossing the Avon, bring the railway into Bath Station.

Preliminary work on Box Tunnel was begun early in 1836 by the sinking of trial shafts to ascertain the nature of the ground, and in September a contract was let for six permanent and two temporary shafts, 28 feet in diameter. Work on these started in November, and in February 1837 the Directors reported :

Unfounded reports were circulated industriously during the first application to Parliament respecting imaginary difficulties to be encountered in the Tunnel through the Box Hill to the east of Bath, and it may be a satisfaction to the Proprietors

to know that trial shafts have been sunk and the strata, through which it passes, fully ascertained; the result of which not only proves the incorrectness of such reports but gives full assurance of the work being free from all unexpected or unusual difficulties. The completion of the permanent shafts is now far advanced, and the works of the Tunnel will be commenced as quickly as possible.

The strata were found to be, successively from the east end, the great oolite or Bath stone, a thick bed of light coloured clay or fuller's earth, the inferior or lesser oolite, and the blue marl between that and the lias, all sloping from west to east at a steep angle to the tunnel, which was to be on a falling gradient of 1 in 100, 53 feet to the mile. Most of the shafts, which varied from about 70 to 300 feet in depth, having been sunk by the autumn of 1837, contracts for the tunnel itself were advertised. There seems to have been some difficulty in letting these, but eventually in February 1838 the greater part of the tunnel was undertaken by George Burge of Herne Bay, a big contractor of the day, and the remaining half mile, through Bath stone at the eastern end, by two local men, Lewis of Bath and Brewer of Box, who had already been engaged in sinking the shafts for this portion. The contracts provided for the work being finished in thirty months—by August 1840—and for defined monthly progress. Burge's part of the tunnel was to be lined with brickwork throughout, while Lewis and Brewer were to leave the bare rock to form the roof and sides. One of Brunel's assistants, William Glennie, was placed in charge of the whole tunnel as Resident Engineer, and remained so throughout its construction.

Lewis and Brewer had already had great trouble from water. In November 1837 one of the shafts was flooded to the height of 56 feet, and their steam pump being

inadequate, work was suspended for some months till they installed a second, worked by a steam engine of 50 horse power. The same thing recurred a year later but was overcome in less than a fortnight. Burge was luckier in this respect, though he also had to make use of a steam pump at one of his shafts.

Apart from these pumps, all the work was done by manual and horse labour, the material excavated being hoisted up the shafts by wretched horses walking round and round, turning drums on which the ropes were wound. A ton of gunpowder and a ton of candles are stated to have been used every week whilst the tunnel was making. For the greater part of the time, work went on night and day; 1100 to 1200 men and over 100 horses being employed by Burge alone; during the last six months these numbers were greatly increased, and 4000 men and 300 horses are said to have been at work on the whole tunnel. The men lodged in the neighbouring villages and hamlets, where all available accommodation was fully occupied and beds never empty, the night shift turning in soon after the departure of the day shift. Drunkenness and fighting were very bad, and on Sundays the foremen were employed in endeavouring to keep the peace in the villages, there being of course no regular police force in those days. Altogether it is not surprising to read that there was much rejoicing among the inhabitants of the country-side when the tunnel was at last finished and the visitors took their departure. Nearly a hundred of the latter are said to have been killed on the works during the whole five years.

By the end of August 1839, 1350 yards of the tunnel had been excavated, and 1200 entirely finished. Six months later Brunel reported that, though the work

had been again much hindered by an increase of water, 1900 yards, nearly two-thirds of the whole length, had been done; to expedite matters, three additional shafts had been sunk and work begun from them in each direction.

Meantime the heavy work of the long cutting and embankment between the tunnel and Chippenham had been commenced in the summer of 1837 but made slow progress; two years later it was only about half finished. Then the wet winter caused slips in the embankment and more delay, but by the summer of 1840 this trouble had been overcome, and by the use of three locomotive engines the lost time was being made up.

Westward from the tunnel to Bath certain deviations from the original plan delayed the final setting out of the line and purchase of land till 1839. The works were begun in the summer, but the necessary diversion of the main turnpike and other roads in the Box Valley, and then the failure of a contractor early in the following year, caused more delay.

In February 1841 Brunel reported as to all this section as follows:

In the immediate neighbourhood of Bath much still remains to be executed on one contract. The diversion of the Kennet and Avon Canal, in the progress of which very serious difficulties had occurred, caused principally by continued wet weather at a critical period of the Works, requires most attention; the retaining wall, however, is nearly completed, and when the course of the Canal is diverted, which will shortly be done, the construction of the Railway itself at this point is a simple and easy operation.

With the exception of this one point, the Works are in a sufficiently forward state between Bath and Bathford. At Bathford the Bridge across the Avon is much in arrear, but the necessary means have been and shall be adopted for securing its early completion.

From this point to the Box Tunnel, the Works are in a forward

state; the long embankment requires but a small additional quantity for its completion, and we are commencing to form the surface preparatory to ballasting.

The small Tunnel in Middle Hill and the adjoining cuttings are nearly finished.

The Works between Chippenham and the Box Tunnel, which have generally been considered as likely to be the latest, are now in such a state that by proper exertion their completion within the time required may be ensured; this exertion shall not be wanting on my part.

The Box Tunnel itself will be completed and open throughout from the Western Face to the Shaft No. 8, which has always been considered as the Eastern extremity, during the next month; and if the whole Tunnel cannot be then said to be finished, it is only because the Eastern end, which is entirely in rock and belonging more properly to the Contract last referred to, has been extended a few yards in order to diminish the quantity of excavation required in the open cutting. The permanent way in the Tunnel will shortly be commenced.

At this time Brunel anticipated opening the whole 27 miles from Hay Lane to Bath simultaneously early in June, but, in spite of continuous night and day work, bonuses to contractors and foremen, and all his efforts, it soon became evident that the western half would not be ready as soon as the eastern, so another partial opening, as far as Chippenham, was made on the 31st May.

Some three weeks later notices appeared in the papers that the railway would be opened throughout from London to Bristol, and to Bridgwater—for the first section of the Bristol & Exeter Railway had been opened on the 14th—on Wednesday, the 30th June. In view of the very unfinished state of the works, especially in the immediate neighbourhood of Bath, this notice seems to have been received with much scepticism by the public. Sir Frederic Smith, inspecting the line on the 28th, found several of the bridges, the fences, and the ballasting very far from complete, and only sanctioned

the opening on Brunel personally undertaking that certain essential details should be completed before the running of the first train, and that every precaution for the public safety should be taken. Saunders also undertook that he and Gooch would personally superintend the traffic on the spot till everything had been fully completed.

The opening accordingly took place as advertised on the 30th June 1841. No public ceremony seems to have marked this important historical event. A beflagged train with Directors and others left Paddington at 8 in the morning, and is stated to have reached Bristol in four and Bridgwater in five and a half hours, but the first train to use the new piece of line between Bath and Chippenham was one for the general public which left Bristol at 7 a.m. for London; when it got there is not recorded.

Box Tunnel was thus described to the Board of Trade:

The Tunnel is 3,193 yards,¹ rather more than $1\frac{3}{4}$ mile, in length, in forming which eight large shafts, numbered from west to east, were excavated, of which Nos. 1 and 8 were afterwards enlarged into the openings or deep cuttings for the entrances of the tunnel at each end, so that six only remained when the work was finished, which were about 25 feet in diameter and varied from about 85 to 260 feet in height above the top of the tunnel. The whole of the tunnel from the western extremity to about 100 yards beyond No. 6 Shaft is lined with brickwork. From thence to the eastern mouth of the tunnel a length of about 900 yards was formed by excavating the natural rock in the shape of a Gothic arch, no part of which is lined with masonry except at the eastern entrance and for a short distance in, where the sides are retained by walls and the roof by an arch built of the stone found near the spot.

¹ Its length is now officially stated to be 3,212 yards.



BOX TUNNEL, EAST END



BOX TUNNEL, WEST END

As a matter of fact there were five or six smaller shafts open during the excavation, but these were all filled in when the work was finished. The tunnel is perfectly straight, and on an incline of 1 in 100 falling towards the west. When it is clear of smoke one can see through from either end, and it is said that on or about the 21st June the sun is visible from the west end before it rises over Box Hill. To check the speed of trains descending the incline, Brunel adopted the curious expedient of substituting for the usual rails on the Down line two flat iron plates, an inch thick, laid on a thick layer of felt, and slightly inclined inwards. How far these answered their purpose, or how long they remained, we know not.¹

At the opening, only a single line was ready through the tunnel, and for the first forty-eight hours on end Gooch, the Locomotive Superintendent, himself acted as pilotman to travel with every train. In his own words: ²

At about 11 o'clock on the second night we had a very narrow escape from a fearful accident. I was going up the tunnel with the last up train when I fancied I saw some green lights in front.³ A second's reflection convinced me it was the Mail coming down. I lost no time in reversing the engine I was on and running back to Box Station with my train as quickly as I could, when the Mail came down behind me. The policeman at the top of the Tunnel had made some blunder and sent the Mail on when it arrived there. Had the Tunnel not been pretty clear of steam, we must have met in full career and the smash would have been fearful, cutting short my career also. But, as though mishaps never come alone, when I was taking my train up again, from some cause or other the engine got off the rails in the Tunnel,

¹ The Down line was entirely relaid in June 1851, all trains being worked over the Up line for eight consecutive days.

² *Diaries of Sir Daniel Gooch*, p. 49.

³ All Great Western engines carried a green headlight at this time, and passenger carriages sidelamps showing green to the front.

and I was detained there all night before I got all straight again. I need not say I was not sorry to get home and to bed at Paddington, after two days and nights pretty hard work.

In order to allay, as far as possible, the public fear of this monstrous and terrible tunnel, it had been arranged to light it throughout with reflector lamps, and Sir Frederic Smith so reported to the Board of Trade. When he came down to enquire into the accident on the Wootton Bassett Incline in September, he discovered that it was not lighted, and reported the fact to the Board, adding that he believed "the lighting would add essentially to the comfort of the travellers, and in some degree to their safety, for, as it is not the practice of this railway to have white lights at the head of the engines, the drivers have at present no means of discovering any obstruction that there might be on the rails in front of them."

To this Brunel replied in his report to the Directors, which was sent to the Board of Trade:

It had originally been determined, as mentioned by Sir Frederic Smith, to light this tunnel, and the lamps were made and fixed, and for a short time the attempt was persevered in.

I think Sir Frederic Smith saw some of the lamps tried; the attempt has been abandoned because it altogether failed. I should observe that I never hoped to be able to produce any great effect towards lighting the carriages; this would require the walls of the tunnel to be whitened and strongly illuminated; my object was to throw a light on the rails, both to assist the workmen engaged in packing, etc., and to enable the enginemen to see ahead. I soon found that the impurity of the air, whether from external fog or from the steam and vapours of the engines, rendered this quite impossible. At most times the lamps were of no use whatever, even to the men at work in the tunnel, and never to the engine driver, to whom of course it is necessary that, if he sees at all, he should see some considerable distance ahead. The lamps were therefore removed.

For the same reason no lamp has ever been used in front of our engines for the purpose of throwing a light ahead upon the line,

and I am not aware that this has ever been successfully practised by others.

It must be a much more powerful lamp than any of those hitherto used for the purpose, that would under ordinary circumstances illuminate the road to a distance of 150 yards, yet this distance, being traversed in about 10 seconds, would be much too short to be useful, and the glare of the lamp thrown upon the foreground would unquestionably render the distance less clear, and in foggy or rainy weather quite invisible. The lamps in front of the engines are used merely as signals.

I am afraid there are no means of remedying the evil of darkness in tunnels (the extent of which evil, however, is this, that the tunnel is during 24 hours as dark as the rest of the line frequently is during the night, but is otherwise exposed to fewer casualties) unless by a general and brilliant illumination, which would of course be very costly.

The expedient of lighting the carriages themselves had not yet been thought of, or at any rate deemed feasible.

The intention of lighting the tunnel was not the only one to be abandoned. In 1839 Saunders told the Parliamentary Committee on Railways that it was intended to work the Box Tunnel Incline by a stationary engine, or possibly by water power. Needless to say, this idea was given up in the course of the next year or so, when the ability of locomotives to climb such banks had come to be recognised. For some time after the opening all trains were assisted up the incline by a bank engine behind. This practice with passenger trains was objected to by Sir F. Smith at the same time as the lack of lighting but defended by Brunel, who instanced two inclines on the Liverpool & Manchester which had been so worked for more than ten years without accident. However, whether in deference to the Inspector-General's views or not, it was soon afterwards abandoned, and the bank engine always attached in front of such passenger trains as needed assistance.

The constant rumours of the insecurity of Box Tunnel were much strengthened in the summer of 1842 by the opinions of an eminent geologist, the Reverend Dr. William Buckland of Oxford, afterwards Dean of Westminster, expressed at a meeting of the Institution of Civil Engineers in May. Without having ever examined the tunnel, he asserted that the oolite rock was of such a nature that large pieces were likely to be loosened and brought down by the concussion of the atmosphere and vibration caused by the trains, and that there was great danger of a serious accident in the unlined portion of the tunnel. This drew a friendly though sarcastic letter from Brunel, in which, while lamenting his lack of scientific knowledge of geology, he ventured to claim, as a result of the very extensive excavations he had been making for several years, a more thorough and practical knowledge of the particular rock in question than even the learned Professor himself, and of course insisted on the absolute safety of the tunnel. In this he was confirmed by Major-General C. W. Pasley, who had succeeded Sir F. Smith as Inspector-General of Railways and was sent down in August, in view of the fears so mischievously excited by Dr. Buckland, to inspect and report upon the state of the Tunnel.

Brunel's half-yearly report, read at the General Meeting at Bristol on the 18th August, thus alludes to the matter:

A report having been generally circulated that parts of the Box Tunnel were unsafe, and that such an opinion was entertained by an authority well competent to judge, I am happy to be able to assure you that such is not the case, and that there has been no foundation for any such report. A portion of this Tunnel, it is well known, is carried through very solid beds of Oolite, and at some parts a particularly sound and hard bed occurred immediately, or within a few feet above the top of the Tunnel. To have left the

looser beds underneath and have lined it with masonry would indeed have been a waste of money, when by slightly varying the height of the excavation a perfectly solid and safe roof was afforded by nature. No precautions were spared in examining and ascertaining the quality of this bed, and the experience of the large quarries in the neighbourhood, joined to our own in carrying on one of the largest excavations hitherto made in the Oolite formation, enabled me to determine beyond doubt the security of the roof thus selected. My own opinion, and that of others well competent to judge and who were engaged in the works, has, I am glad to say, received a strong and a very satisfactory confirmation.

The reports referred to were considered by the Board of Trade sufficiently important to induce Lord Ripon to direct that a survey of the work should be made by General Pasley; that examination, made with the utmost care, has led to his expressing to me his perfect satisfaction of its security, and his opinion that it would have been an useless expense to have arched those portions of the Tunnel.

Not quite three years afterwards a very severe frost in March 1845 caused some scaling and brought down a piece of stone weighing about three hundredweight from a spot 160 yards west of No. 7 Shaft, where a temporary airshaft, made during the construction, had been blocked up. The stone happened to fall in front of a light engine on its way back to Box and threw it off the rails, causing some delay to the trains but no other injury. This determined J. W. Hammond, the Resident Engineer of the line under Brunel, and his assistant in charge of the tunnel, W. G. Owen, to turn brick arches under the blocked air shaft and also under No. 7 Shaft, and to fill up the latter. Major-General Pasley again came down and, while approving of these expedients and considering them all that was absolutely necessary, recommended that No. 6 Shaft should also be blocked up, as an extra precaution against frost; but making a second visit a month later, he changed his mind and withdrew the

suggestion. On this last occasion he brought with him the redoubtable Dr. Buckland himself, who, after spending several hours tapping and minutely examining the rock with his geological tools, was forced to admit that his former fears were groundless, and that the unlined tunnel was perfectly safe.

Curiously enough, almost exactly fifty years after this, another severe frost caused the tunnel to be closed to



BATHFORD BRIDGE

traffic in March 1895 for over a month, while more of it was lined with brickwork.

Returning to 1841 and the newly opened line, half a mile west of the long tunnel was a short one of 200 yards through Middle Hill. Beyond this, the deep Ashley Cutting was not yet finished off, and a siding had to be made to remove clay from the hillside. The bridges over the Avon at Bathford and immediately outside Bath Station were both handsome single arches of the local stone, of 54 and 88 feet span respectively.¹ Other

¹ Their appearance has been quite spoilt in modern times by unsightly patches of brickwork!

works calling for mention are the long and high retaining wall supporting the canal above the railway between Hampton Row and the two short tunnels, respectively 77 and 99 yards long, under the houses of Bathwick Hill, and the viaduct of 37 plain arches leading to the river bridge. The only intermediate stations between Chippenham and Bath were at Corsham and Box.¹ Close to the



BATH: ST. JAMES BRIDGE AND STATION

former a high stone arch of 90 feet span carries a road across the cutting.

By this time the Bath Station was practically finished and covered with a roof of 50 feet span, supported on each side by a row of large iron columns, most inconveniently placed within four feet of the edge of the platform. The principal timbers of the roof were like the long arms of cranes meeting in the middle and resting on the columns, the short arms being held down by the side walls behind the platforms. This peculiar plan was adopted to avoid, without the use of cross ties, outward thrust on the walls,

¹ Bathampton was opened in 1857.

which were built on top of a viaduct of stone arches.¹ There were four lines of rails under the roof, the two in the middle used as sidings. The goods shed was a small building with several turn-tables on the Up side, immediately west of the station and at right angles to the main line.²

The Bristol Terminus, for the same reason, had a



BATH STATION

similar though more elaborate roof of 72 feet span covering five lines of rails, but here the columns were smaller and joined by arches.³ At each place the booking

¹ Save for the lengthening of the platforms at each end outside the building, this station remained without noticeable alteration till 1897.

² It remained in use till 1877, when a new Goods Station was established half a mile to the west.

³ The original terminus still exists unaltered save by the widening of the platforms, now known as Nos. 6 and 8 of the Joint Station,



THE BRISTOL TERMINUS

office was below on the ground floor, and at Bristol the waiting rooms were also in the arches under the station. A sector-table was provided at the end of the arrival line to release the engines of incoming trains, and there were a traversing frame inside and several turn-tables just outside the terminus. At the west end was a large building with an ornamented front towards the street, containing the Board Room and Offices of the Bristol Committee and their Secretary, as well as a residence for the Station Superintendent. Here the united Board of



FRONT OF THE BRISTOL TERMINUS

Directors used frequently to meet, and the August Half-yearly Meetings of the Shareholders were regularly held from 1841 until 1858 inclusive.¹

The goods shed, a large building 326 feet long by 138 wide, was north-east of the station on the ground level beside the Floating Harbour, 12 feet below the railway and at right angles to it. Access was afforded by turn-tables and a double lift resembling a pair of scales, worked by hydraulic power, whereby trucks were alternately raised and lowered. It was not finished till the autumn of 1842.

and the consequent abolition of one of the five lines of rails, but the approaches and arches below are no longer used by the public.

¹ The rooms are now used as offices by the Divisional Engineer and the Bristol Goods Agent and their staffs. The handsome old Board Room has been divided.

WESTERN FOODS STORE

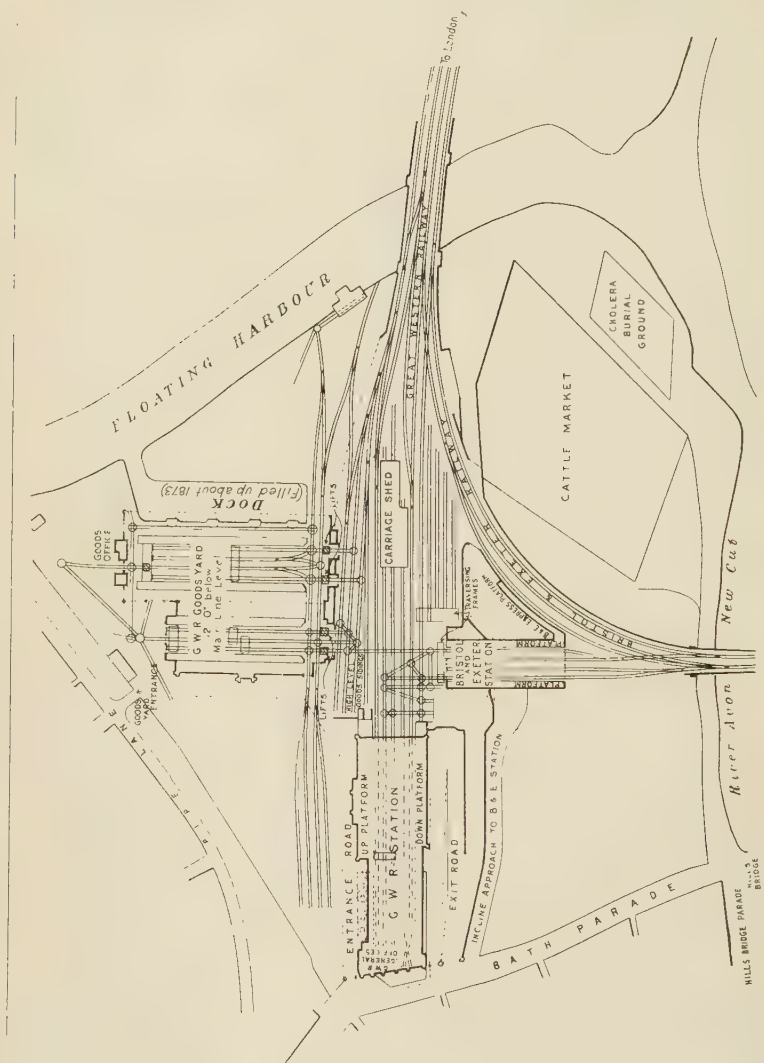


Not quite half a mile east of the terminus, on the south side of the line opposite the engine shed, a series of coke ovens was built, which soon began to supply all the Company's engines, superseding the original small establishment at West Drayton. The coal used came from the Rhondda Valley, of course by sea from Cardiff to Bristol. The engine shed over the way was a comparatively small building, accommodating only fifteen engines on its three lines.

Between the engine shed and the station, the bridge over the Floating Harbour, finished only the year before, was already being widened to provide for a direct junction with the Bristol & Exeter Railway. That line, for some reason, probably to avoid the purchase and demolition of expensive house property in the town, had been laid out by Brunel to commence at right angles to the Great Western just outside the terminus of the latter. Early in February 1841 the Great Western Board sanctioned the formation of a junction involving the widening of the Harbour Bridge and the adjacent land arches for some distance from the station to admit of four lines of railway instead of two, the piers and foundations for such increased width having already been built in anticipation. The Bristol & Exeter Company were to pay half the cost of this work, and the southernmost pair of lines were to be reserved for their permanent use after the expiry of the lease of their undertaking to the Great Western. The Bristol & Exeter Directors agreed to this, and proceeded forthwith to make the curve from their line to the bridge, but whether it was ready in time for the opening to Bridgwater on the 14th June is a matter of doubt; it was certainly in use very soon

afterwards.¹ Another connection between the two railways was afforded by turn-tables outside the Great Western Terminus, which for many years were used for the transfer of single vehicles and goods trucks. There was no separate Bristol & Exeter Station till 1845.

¹ Sir Frederic Smith's Report to the Board of Trade on the Bristol & Exeter Railway from Bristol to Bridgwater, dated 1st June 1841, states "It *will* form a junction with the Great Western Railway at Temple Meads, Bristol," which suggests the junction was not then complete, but it is shown as open for traffic on an official plan dated August 1841. The Bristol & Exeter Company paid their share of the cost to the Great Western in October 1841. The legend that the turn-tables were for many years the only connection between the railways, as distinguished from the stations, turns out to be a myth.



PLAN OF THE BRISTOL STATIONS, 1845

CHAPTER V

EARLY GROWTH

More Capital—Charles Russell, Chairman—Cheltenham & Great Western Union, and Bristol & Exeter Railways leased—Swindon Refreshment Rooms and Works—A new Town—Organisation—Steventon—Cheltenham & Great Western Union Railway—Oxford Railway—Completion of Cheltenham Branch—Sapperton Tunnel—Gloucester—First Mixed Gauge Line—Opening to Exeter—Extension Schemes—West London Railway—Suburban Ambitions—Windsor.

IT very soon became obvious that the broad-gauge railway from London to Bristol—let alone the branches to Bradford and Trowbridge, which had not been attempted—was not going to be made for anything like the capital authorised by the Act of Incorporation—two and a half millions by shares and a third of that sum by loans, in all £3,333,333. Half the subscribed capital having been paid up by October 1837, a Special Meeting was held to sanction the issue of the mortgage debentures, and also the borrowing of the balance of capital by loan in anticipation of further calls on the shareholders.

In the following August the Directors broke to them that new estimates had been made, based on the cost of the portion already finished, which showed the total cost of the land and works on the whole line would be £4,280,928, exclusive of locomotive power and carriage stock. In addition, Parliamentary and general expenses would absorb £288,000 of capital. The necessary powers having been obtained from Parliament, a further million

and a quarter was raised by the issue in June 1839 of half shares of £50 each, nearly all of which were taken up by the existing shareholders, and a third of that sum by more debentures early in the next year, bringing the total capital up to five millions. Still more being required, the Directors were authorised in August 1840 to create 37,500 fifth shares of £20 each, and to borrow £600,000 on loan notes, to be paid off at fixed periods in cash or debentures. A year later, when the line had been opened throughout, they announced that the total cost of it, including, besides engines and rolling stock and everything necessary for the completion of the works, the locomotive establishment at Swindon, and coke ovens at Bristol, would be £6,150,000. This enormous increase over the original estimate was ascribed to the expensive Paddington Extension, for which no provision had been made, the exorbitant sums paid for land, the costly means adopted for expediting progress, and various contingencies such as slips in cuttings and embankments, which often involved the purchase of additional land. By the end of 1841, £6,340,000 had been raised, more than half by debentures and loan notes, and £6,282,000 spent. At this time £35 remained to be called up on each original share and £16 on each fifth share, the half shares being fully paid. The original shares were not fully paid till 1849.

The autumn of 1839 saw several changes in the Directors of the Company. In November the Chairman, William Unwin Sims, who had succeeded Benjamin Shaw in October 1837, committed suicide. The tragedy is thus recorded in Gibbs' Diary:

November 16th—On Tuesday I attended the usual Committee
—Sims was in the chair. On Thursday Sims was in Princes Street

and at the Bank. The next morning he was found dead in his bed, undressed and with a pistol in his hand, with which he had lodged a ball in his head. We were all dreadfully shocked with this most unexpected tragedy, as there was nothing in his manner or conduct or circumstances to create the slightest suspicion of such an event.

Sims does not appear to have been a strong Chairman. Though he had himself proposed his election, Gibbs frequently complains of his weakness and vacillation in the struggle with the Liverpool opposition, and, after that was over, wrote in April 1839:

I was much annoyed to-day by the bad judgment shown by our Chairman Sims with respect to the attempt made in Parliament to make an *ex post facto* change in our Act. I have no confidence in his judgment at all and am afraid that we made a great mistake when we appointed him Chairman. Unfortunately he feels no diffidence on this subject himself.

Three other members of the London Committee, among them Shaw, the first Chairman, and one of the Bristol Directors, disappeared from the Board about this time. One of their successors was the sixth Viscount Barrington of Beckett Park, Shrivenham, M.P. for Berkshire 1837-57, who afterwards succeeded Robert Bright of Bristol as Deputy Chairman.

On Sims' death, Charles Russell was unanimously elected Chairman of the Company, whose growth and policy he was to rule with a strong hand for sixteen momentous years. In fact, he, Saunders, and Brunel, besides being the great champions of the Broad Gauge, may be regarded as the founders of the Great Western System of to-day. He was the second son of Sir Henry Russell, 1st Baronet, of Swallowfield Park near Reading, and was born in 1786. It is a curious coincidence that he was ten years older than Saunders, Saunders ten years older than Brunel, and Brunel ten years older than

Gooch. After serving for some years as an officer in the East India Company's Bengal Army, Charles Russell returned home and entered Parliament as a Conservative member for Reading in 1830, sitting for that town till 1837, and again from 1841 to 1847, when he was finally defeated. As we have seen, he was Chairman of the Committee on the Great Western Bill of 1835, and did much to help its passage.

At this time there was some prospect of the Great Western Railway forming part of the line of communication between London and Dublin. Of the three schemes proposed, one was for a railway surveyed by Brunel, and of course intended to be on the Broad Gauge, from Didcot through Oxford, Evesham, Worcester, Ludlow, Newtown, Dinas Mawddwy, Dolgelley, Barmouth, and Portmadoc to Porth Dynlleyn near Nevin on the north-west coast of Carnarvonshire, where an entirely new harbour was to be constructed. Another, for which Vignoles was responsible, was to reach the same place, whence the passage to Dublin was supposed to have some advantages over that from Holyhead, by a railway from the Grand Junction at Wolverhampton by Shrewsbury, Llangollen, Bala, and Dolgelley. Robert Stephenson, for his part, proposed a line from Chester along the coast to Holyhead and the enlargement of the small harbour there. In view of the importance of the subject, the Government appointed a Commission of three with two naval advisers to report on the merits of the rival projects. Though Brunel's line was favourably regarded by the Commissioners, they eventually reported in favour of Holyhead and Stephenson, on the advice of the naval experts that a harbour at Porth Dynlleyn would be liable to be silted up and could not be made as satisfactory

as one at Holyhead. Another attempt to reach Porth Dynlleyn with a broad-gauge railway from Worcester was made during the mania year of 1846 but failed, after which that potential port faded back into the obscurity in which it has ever since remained.

In 1840 the first extension of the Company's field of operations was undertaken by the leasing of two other railways. In April the Cheltenham & Great Western Union Company accepted the terms offered them in 1837, and agreed to lease the portion of their line between Swindon and Cirencester, which was now approaching completion, to the Great Western for seven years from its opening at a rent of £17,000 a year. Meantime negotiations were in progress with the Bristol & Exeter Company, who at this time were desirous of avoiding an outlay of capital on engines and rolling stock. These eventuated in August in an agreement for a lease of their railway, in the first instance as far as Bridgwater with a branch to Weston-super-Mare, which section they undertook to have ready for opening by the 1st June 1841, at a rent of £30,000 a year and a toll of a farthing a mile on every passenger and ton of goods or coal carried; all subsequent extensions of the main line to be included in the lease at a proportionate mileage increase of rent, and the lease to remain in force for five years from the completion of the railway to Exeter.

SWINDON

As we have already seen, the fiat for the establishment of Locomotive Works at Swindon went forth on the 6th October 1840. The Directors' Report of the following February thus alludes to the subject:

The final determination of working those two Railways¹ upon Lease has imposed upon the Directors the necessity of providing an increased stock of Locomotive Engines, Carriages, Waggons and other Plant adequate to the trade which may be reasonably expected.

It has also decided the Directors to provide an Engine Establishment at Swindon, commensurate with the wants of the Company, where a change of Engines may be advantageously made, and the Trains stopped for the purpose of the Passengers taking Refreshment, as is the case at Wolverton on the London and Birmingham Railway. The Establishment there would also comprehend the large repairing shops for the Locomotive Department, and this circumstance rendered it necessary to arrange for the building of Cottages, etc., for the residence of many persons employed in the service of the Company.

The Directors have, under these circumstances, made an arrangement with responsible Builders for the erection of Refreshment Rooms and Cottages, without the employment of any Capital from the Company. The profits of the refreshment business are to remunerate them for all the outlay in the accommodation required at Swindon by passengers, consequent upon the trains stopping at that place. The Company are to provide the land for the cottages, and to secure to the Builders a fixed rent upon lease, which rent will of course be reimbursed by the tenants of the cottages.

The only increased demand, therefore, upon the Company for capital at Swindon, will be to defray the cost of that additional land, and of the Engine Establishment and Repairing Shops there, which are indispensably necessary.

The responsible Builders were Messrs. J. & C. Rigby of Millbank, Westminster, who had already been employed by the Company to build all the stations between Steventon and Corsham, as well as that at Slough. They were now commissioned to build the refreshment rooms, locomotive establishment, and 300 cottages for workmen, which last formed the nucleus of the town of New Swindon.

It was the Directors' desire to avoid any further addition to the already swollen cost of the line that led

¹ Cheltenham & Great Western Union and Bristol & Exeter.

them to make the unfortunate arrangement as to the refreshment rooms, which they were soon to regret, and which remained an almost intolerable incubus on the Company for more than half a century. To ensure remunerative profits to Messrs. Rigby for their outlay in building the station at their own expense, it was agreed that all regular trains should stop at Swindon "for a reasonable period of about ten minutes," and that no rival stopping-place for refreshments should be established between London and Bristol. This agreement was eventually embodied in a lease of the premises to Messrs. Rigby for 99 years from Christmas 1841 at a rent of one penny a year.

Within a week of the completion of the lease in December, Messrs. Rigby sublet the refreshment business to S. Y. Griffiths of the Queen's Hotel, Cheltenham, for seven years in consideration of a premium of £6,000 and a rent of £1,100 a year; and in August 1848 they sold the lease outright to one J. R. Phillips for £20,000.

From the very first the refreshment arrangements were most unsatisfactory. Pending the completion of the permanent buildings, Griffiths had evidently set out to make his profits in some temporary accommodation, for on the 1st February 1842 the Great Western Directors resolved that the charges and management of Swindon Refreshment Rooms were most objectionable in every respect, and gave notice to Messrs. Rigby that the quality and prices of provisions are so unsatisfactory they must make an immediate alteration. The power of supervising the quality of the food supplied and settling the prices to be charged had indeed been reserved to the Company by the lease, but apparently there was great difficulty in enforcing it. Complaints continued to be



SWINDON STATION, *c.* 1850



FIRST-CLASS REFRESHMENT ROOM, SWINDON, *c.* 1850

general for many years. In December 1842 we find Brunel himself writing a characteristic letter, evidently in reply to one from Griffiths.

DEAR SIR,

I assure you Mr. Player was wrong in supposing that I thought you purchased inferior coffee. I thought I said to him that I was surprised you should buy such bad roasted corn. I did not believe you had such a thing as coffee in the place; I am certain that I never tasted any. I have long ceased to make complaints at Swindon. I avoid taking anything there when I can help it.

Yours faithfully,

I. K. BRUNEL.

The permanent refreshment rooms were opened to the public on the 14th July 1842. Two large three-storeyed stone buildings, each 170 feet by 37, were erected on either side of the main line, here consisting of four roads, and respectively between it and the departure and arrival lines of the Cheltenham Railway. The basements contained kitchens, offices, and attendants' rooms; the principal floor of each building was wholly occupied by a large refreshment room, surrounded by covered platforms 14 feet wide on each side and 7 feet at the ends, and divided into first- and second-class portions by columns and an oval counter in the middle at which the refreshments were sold. Needless to say, third-class passengers were not catered for. These rooms were heavily decorated in the terrible style of the period, "the walls and ceiling Arabesque and the columns painted after a recent invention to resemble inlaid wood,"¹ and were considered very magnificent.

The top storeys of both buildings, joined by a covered bridge, formed an hotel, the coffee and sitting rooms being on the south and the bedrooms on the north side of the

¹ Bourne's *History*.

railway. Until a subway was provided many years later, the bridge was also used by passengers requiring to cross the line.

The locomotive works, situated in the fork between the Great Western and the Cheltenham Railways, were at last finished and brought into regular operation on the



ENGINE HOUSE, SWINDON, *c.* 1845

2nd January 1843, Archibald Sturrock being installed as Manager under Gooch. The establishment is thus described by Bourne in the following year :

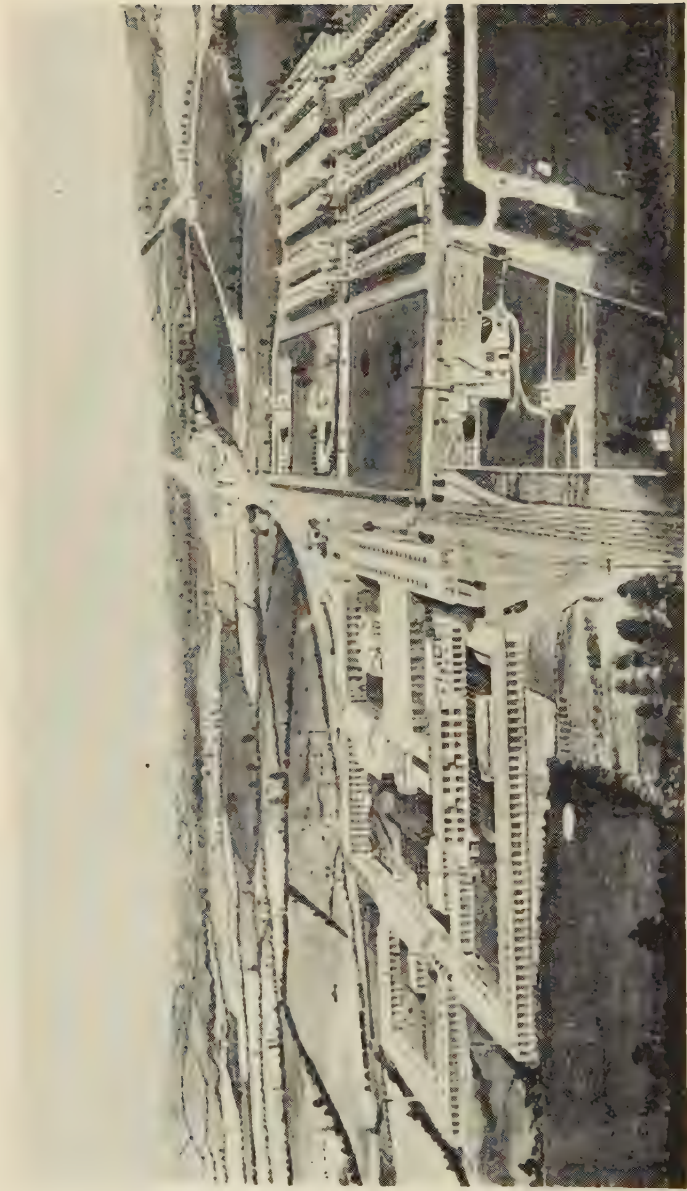
At some distance west of the passenger station, on the north side of the line, is the Engine depot ; its arrangements are upon a large scale, and capable of accommodating about a hundred engines ; these consist of the engines in actual use, of the stock of spare engines, and of those undergoing repair. At this station every train changes its engine, so that from this circumstance alone, at least twice as many engines are kept here as at any other part of the line.

The Engine Shed is a rectangular building, 490 feet long by

72 broad, and capable of holding upon its four lines of rails forty-eight engines and tenders; the two ends are open, the roof is of wood, slated, with louvres at intervals for the escape of steam. The engines standing here are all in serviceable condition, and a sufficient number of them are ready with their steam up to carry on the business of the Railway. In the centre of and at right angles to this shed and abutting against its northern side is the Engine House. This is an oblong room 290 feet by 140, divided by two rows of columns into three compartments; the engines stand in the side compartments transversely, as horses in the stalls of a stable; and the central part, 50 feet broad, is occupied by a large platform, travelling on wheels from one end of the house to the other, by means of which an engine can be readily transferred between the central part and any one of the stalls. Here the engines receive their lighter repairs, those which the enginemen themselves are for the most part capable of executing. The roof of this shed is of timber and wrought iron, covered in with slating; the stalls will contain thirty-six engines and tenders. At the northern end of the Engine House are placed the buildings employed in the repairs of locomotive engines. The Erecting House, in which the parts of the engine machinery when repaired are put together, is a building communicating with the Engine House, and capable of holding eighteen engines.

Such were the original Swindon Works. They soon began to grow. Early in 1846 the first home-built engines were turned out, and in this and the next two years large sums were spent on new shops and machinery. Soon 1,800 men were employed, to be reduced to 600 in 1849, when the first wave of economy set in. Owing to this reduction, a large part of the works, which then covered $14\frac{1}{2}$ acres, and much costly machinery, were for a time rendered useless. The new town kept pace with the works. Speculative builders began almost at once to add largely to Rigby's 300 cottages, and very soon the Company were obliged to build more.

G. H. Gibbs, the Director whose Diary has afforded us so many glimpses of early days, died in August 1842, bequeathing £500 towards the erection of a Church and School at Swindon. This led the Directors in the following



NEW SWINDON, BIRD'S-EYE VIEW, c. 1850

February "to implore for individual contributions from the Proprietors to provide the means of religious instruction and worship for the men and families to be located there." In August 1840 they had proposed, at "the earnest representation of the Clergyman and Inhabitants of the Parish of St. Philip and Jacob in Bristol," to devote half an acre of the Company's land there to the erection of a Church, in which "a certain number of Sittings should be appropriated for the Servants of the Company"; but the Proprietors had naturally objected, and convinced them that such an application of the Company's property or funds was wholly beyond its powers. Their Swindon appeal for subscriptions was so successful that they were able to set about the erection and endowment of the Church and School forthwith, and these were completed in 1845.

To revert to the general affairs of the Company, an important step in organisation was made by the Board on the 3rd November 1840, when it resolved:

That the present London Secretary be appointed Secretary and General Superintendent of the Line.

Their February Report contains the following paragraph on the subject:

The Directors, considering it their duty to make an appointment for the general superintendence of the traffic in order that the responsibility might devolve upon an Officer of the Company, have nominated the present London Secretary for that purpose, who has consequently entered upon those duties.

In practice, Saunders seems "to have entered upon those duties" from the first opening of the line; he told the Parliamentary Committee of 1839 that anything

unusual in the way-bills of the trains was reported to him daily, and we find Seymour Clarke making constant reports to him throughout that year. However, this was the first formal step in making him what he soon became, the chief executive officer of the Company. It definitely raised him over the Bristol Secretary, Thomas Osler, who had resigned the secretaryship of the Bristol & Exeter Company to succeed Captain Chapman on the Great Western in May 1837, and also of course over Seymour Clarke, who had been appointed "Chief Traffic Superintendent" at Paddington at the time of the opening to Maidenhead.

As soon as the railway had been completed throughout, a reduction of the number of Directors from twenty-four to eighteen was decided on; this was effected by one death and five resignations before the next Half-yearly Meeting in February 1842. Six months later, a further reduction to twelve was decreed, to be effected as vacancies by death or resignation should occur; it was not completed until the end of 1847.

Meantime great changes had been made by the adoption by the Board in October 1841 of a report made by the Chairman and Deputy Chairman as to the future management of the railway. The separate London and Bristol Committees were abolished and Traffic and General Committees appointed, Saunders becoming executive officer of the former, and Osler of the latter. These two Committees were to meet weekly. All meetings of the Board and of the Committees were to be held at Steventon, "if the requisite offices can be provided there without material expense." The two Traffic Superintendents, Seymour Clarke and his brother Frederick, were to act in the capacity of assistants to the General

Superintendent of the Line for their respective districts.

Brunel was forthwith directed to prepare plans for the alteration of the rooms in the superintendent's house at Steventon to accommodate the Board and Committees, and in the following April the work there was ordered to be expedited.

Steventon was evidently chosen as being a halfway house between London and Bristol; until the opening of the branch to Oxford it was regarded as an important first-class station. It did not long remain the centre of Great Western government—for barely six months as events turned out. The first meeting was held there on the 21st July 1842, and what appears to have been the last on the 5th January 1843. By this time the Directors had decided, as a measure of economy, to consolidate the London and Bristol Offices and to concentrate all the Company's business in London. Reporting this to the Shareholders in February, they added that the abolition of the separate office at Bristol involved the retirement of Mr. Osler from the service: "The Directors feel it due to him to report that he has faithfully served the Company and devoted himself to the duties of his office with exemplary zeal, integrity and industry." After this the Bristol Directors, of whom there were necessarily under the Company's Acts at least four, had perforce to travel all the way to London to attend the Board.

In 1843 the Company exhibited the first symptom of that appetite for swallowing lesser railway companies which it indulged at frequent intervals during the next eighty years till the craving was finally satiated by a surfeit of Welsh coal railways forcibly administered by Parliament. The appetiser was the unfortunate

Cheltenham & Great Western Union Railway Company, whose sad story we must now relate.

Before doing so, the opening of the Bristol & Exeter Company's line from Bridgwater to Taunton, 163 miles from Paddington, on the 1st July 1842, and its extension for $8\frac{1}{2}$ miles to Beambridge beyond Wellington, where it crossed the main Exeter turnpike road, on the 1st May 1843 must be recorded. For the time being these formed additions to the Great Western system under the existing lease.

THE CHELTENHAM & GREAT WESTERN UNION RAILWAY

In the autumn of 1833, very soon after the issue of the prospectus of the Great Western, some enterprising residents in Cheltenham and its neighbourhood projected a railway from that town by way of Gloucester and Stroud to join the line from Bristol and so afford communication with London. No practical steps were, however, taken till after the Great Western Company had obtained their Act in 1835. Then, Brunel having made a survey of the proposed line, a public meeting was held in Cheltenham on the 13th October, at which it was resolved that "An Act having been obtained for making the Great Western Railway, it would be productive of important advantages to the town of Cheltenham and to the agricultural, manufacturing, and commercial classes of the City and County of Gloucester, that a Railway should be established from Cheltenham to join the Great Western Railway at or near Swindon in the County of Wilts."

The Cheltenham & Great Western Union Railway Company was accordingly formed with a capital of £750,000, more than enough to cover the entire expense of the line according to Brunel's sanguine estimate, and a Bill deposited for the 1836 Session of Parliament with the warm support of the Great Western Company. Unfortunately it was not destined to have a calm passage like that for the Bristol & Exeter Railway. The London & Birmingham Company had already begun to think imperially and proposed to annex all the country north of the Great Western. With this object they supported, if they did not actually promote, a company to make a line from Tring to Cheltenham, passing by Aylesbury, Thame, north of Oxford with a short branch to that city, Witney, Burford, and North Leach. It would have had the advantage of being more than 20 miles shorter—99 miles from Euston as against 120 from Paddington by Swindon—but its gradients were incomparably worse all the way from Tring.

A strenuous fight in Parliament gave the Cheltenham & Great Western Union Company the victory, and the Tring attack was defeated, to be renewed a couple of years later and again defeated. The Thames & Severn Canal Company was another formidable opponent, as was Squire Gordon of Kemble, each of whom had to be bought off for £7,500 as “compensation for damage to be sustained.”

The Bill for the Birmingham & Gloucester Railway was also before Parliament in this session, and as both Companies claimed the ground between Cheltenham and Gloucester, they very sensibly agreed to share it and make what was in effect a joint line. But the idea of a

joint line as we know it seems to have been strange to the lawyers of the day, so they made the curious arrangement we shall find in the Act.

The two Companies also agreed to purchase jointly the old Cheltenham and Gloucester Tramway for £35,000, on which sum the tolls were then paying $6\frac{1}{2}$ per cent. This was a plate tramway from the Berkeley Canal Basin at Gloucester to Knapp Toll Gate, Cheltenham, with a branch to Leckhampton Mill, some 9 miles long in all, established under an Act of Parliament of 1809 and entitled "The Gloucester & Cheltenham Railway." It was worked by horses and used chiefly for the conveyance of coal. Only a small portion near Gloucester was used for the new railway; it continued to be worked and to pay small dividends down to 1859, when the Great Western and Midland Companies obtained an Act for its abandonment with power to sell the land.

The Cheltenham & Great Western Union Act, which received the Royal Assent on the 21st June 1836, authorised railways from Cheltenham near a place called the Cold Bath in the tithing of Alstone, and from the east side of the new Cattle Market in Gloucester, to unite in a field in the Parish of Wotton St. Mary, and thence through Stonehouse, Stroud, Chalford, and Kemble to a junction with the Great Western Railway where it crosses the North Wilts Canal near Swindon, with a branch from Kemble to a piece of land called Botany Bay in Cirencester. Clauses for the protection of Mr. Robert Gordon, who evidently was no friend to the new-fangled method of travelling, provided that the railway should be in a covered way where it passed near Kemble House, and that no public station should be made on his estate. Hence Kemble Tunnel, 415 yards long, exists to

this day, while for many years the junction of the Cirencester Branch was merely a junction with platforms to enable passengers to change trains, and did not appear in the public time-tables until 1872. The station for the neighbourhood was therefore established a mile farther on just across the ancient Fosse Way, which here formed the boundary of Mr. Gordon's land and the counties of Wilts and Gloucester. Under the name of Tetbury Road it accommodated passengers as well as goods from the opening of the line till June 1882, by which time a proper station had been built at Kemble, barely a mile off. More recently rechristened Coates, it still exists as a goods station. Another clause, also apparently to pacify the Squire of Kemble, enjoined the Company to build a new road-bridge over "a stream called the Thames" in his parish.

With regard to the line between Cheltenham and Gloucester, the Act provided that the powers of the Birmingham & Gloucester Company under their Act, which had been passed two months earlier, should be inoperative, provided that upon tender by them to the Cheltenham & Great Western of half the actual cost incurred in making the line, the latter Company should become trustees for the former of the half of the line nearer Gloucester; after payment of that sum the Birmingham & Gloucester were to have the sole direction and control of such half, as if they had made it themselves. The Birmingham Company were to make the depot at Gloucester at their own cost for the use of both, the Cheltenham Company leasing them the land required, while the latter were to make the common depot at Cheltenham.

Although the gauge of the Cheltenham & Great

Western is not defined in the Act, it is clear that the broad had already been decided on, as the line between Cheltenham and Gloucester is directed to be formed "in such manner and with rails of such shape and *width*" as was adapted for carriages running on the Birmingham & Gloucester and London & Birmingham Railways, subject to the power of the Cheltenham & Great Western to lay additional rails for its own traffic at its own expense. Afterwards each Company was to keep its own half in good repair, including the extra rails required for the other's traffic. The Cheltenham Company was bound to complete the line in readiness to be opened at the same time as that between Birmingham and Cheltenham.

Having obtained the Act, the Directors, of whom W. H. Hyett of Painswick House was Chairman, were in no hurry to proceed with the works. Hard times had set in and money was scarce. More than a year later, in November 1837, they reported that the condition of trade and the public credit had been so discouraging that they had been unable to make any material progress in the undertaking, but that these having then slightly improved, they were considering where to commence operations. After discussing the claims of the Cheltenham and Gloucester section, they recommended for reasons they gave at length that a start should be made on the portion between the junction with the Great Western and Cirencester, so that as soon as the Great Western had reached Swindon a continuous line would be open from London to Cirencester, whence coaches would complete the journeys to Stroud, Gloucester, and Cheltenham. They had accordingly made a conditional arrangement with the Great Western for a short lease

to them of that portion when completed at a rent of £17,000 a year, which would give a satisfactory return on the £35 a share proposed to be called up for this purpose. As regards the rest of the line, they were applying to Parliament for an extension of time.

Needless to say, this course did not commend itself to the Directors of the Birmingham & Gloucester Railway, who had been getting on with their own line and were dependent on the Cheltenham Company for its completion to Gloucester. So they opposed the Bill in Parliament and obtained the insertion of clauses providing that if the Cheltenham Company had not purchased all the land required between Cheltenham and Gloucester by the 21st March 1839, or had not completed the railway by the 24th June 1840, then, in either case, the Birmingham Company should take over all the powers of the Cheltenham and do what was necessary themselves. If this should happen, the Cheltenham Company were empowered, provided they had completed their own line throughout from Swindon to Gloucester by the 21st June 1845, to repurchase on payment of half the cost of the line, and thereupon the whole line between Cheltenham and Gloucester was to revert in them as if they had made it under the original Act, subject of course to their trusteeship of the half nearer Gloucester.

Besides giving two years extension of time, this Act of 1838 authorised a deviation at Frampton Common which shortened and straightened the Sapperton Tunnel, and provided that each Company should make its own separate station in Gloucester.

The Directors now felt obliged to proceed with the Cheltenham-Gloucester section, and at the next Half-yearly Meeting, held at Stroud—hitherto they had all

been at Cheltenham—announced that two contracts had been let extending from the Lansdown Road at Cheltenham to the Barnwood Road at Gloucester, and that, all the land having been purchased, the contractors were at work. In the Cirencester Division two contracts covering the line to Minety had been let and the land bought with the exception of three acres, while two more contractors had taken the piece from Minety to Swindon. With the exception of Squire Gordon's portion, for which they had agreed to pay at an exorbitant rate to get rid of his opposition in Parliament, the Directors stated they had acquired the land on favourable terms. In one case near Cheltenham, which had to be referred to a jury, £1,056 was awarded, the claim having been for £2,200. Special thanks were accorded to Earl Bathurst "for his kind assistance on all occasions in furthering the interests of the Company." A quaint feature appears in the accounts for this half year entitled "Income Account," showing a net receipt of exactly £100,318 17s. 5d. A sub-title, however, reveals that the figures given represent "*Traffic Expected* on the Cheltenham and Great Western Union Railway"!

Early in 1839 the Birmingham & Gloucester Board purchased four acres near the Cattle Market in Gloucester for their station, so the Cheltenham Company, as in duty bound, bought the land and let a contract for the railway between it and the Barnwood Road, using part of the old tramway for the purpose. The two Companies also agreed that each should have its own separate station in Cheltenham as well as in Gloucester.

All this time no attempt had been made even to begin work on the line between Kemble and Gloucester, beyond the sinking of five shafts for the Sapperton Tunnel. The

shares of the Company were at a heavy discount, its credit very low, and the Directors most reluctant to make calls on the Shareholders. At the end of the year only about £200,000 had been received, and the arrears amounted to over £40,000.

Finances were so desperate that in November the Directors, considering that it was not even practicable to complete both ends of the line simultaneously, decided to concentrate their resources on the portion between Cirencester and Swindon, and suggested to the Birmingham & Gloucester Company that they should take steps to ensure the early completion of the line between Cheltenham and Gloucester. That Company, in conjunction with the new Bristol & Gloucester Company, which was to use the Cheltenham & Great Western between Stonehouse and Gloucester, then made a proposal to buy the whole line from Cheltenham to Swindon, and actually promoted a Bill in Parliament for power to do so, but early in the next year the proposal was dropped and the Bill withdrawn.

Soon afterwards the Birmingham Company decided to take over the Cheltenham-Gloucester line in exercise of their powers under the Act of 1838, and arranged with the Cheltenham & Great Western to pay off the money they had spent on it by instalments of £20,000 a month, besides the £17,500 they had contributed to the purchase of the tramway. The line was accordingly handed over to them on the 18th June 1840, six days only before the opening of their own railway from Bromsgrove to Cheltenham. At the end of April Brunel had reported that all the principal works between the Lansdown Bridge at Cheltenham and the proposed station at Gloucester had been completed, except two road bridges which were

three-quarters finished; so their Engineer, Captain Moorsom, had little to do but lay the permanent way. This and the Gloucester Station were ready by the 4th November, when the line was opened as part of the Birmingham & Gloucester Railway.

The works between Cirencester and Swindon were now at last approaching completion, and the Directors obtained the sanction of the shareholders to lease that portion to the Great Western on the terms suggested in 1837. This lease was for seven years from the opening, at a fixed rent of £17,000. The opening, expected for January, was delayed for some months by slips in the embankment near Swindon. This embankment, about $1\frac{3}{4}$ miles long and averaging 20 feet high, was formed of clay obtained from side cuttings, much of it in the wet winter of 1839-40. Several small slips occurred in the following year, and in repairing these the interior of the bank was found to be saturated with water and in a very soft state. At one place it had subsided as much as 8 feet in 24 hours! To remedy this, Brunel first tried burning large masses of clay on the slopes, and then filled up portions of the side cutting where the foundation of the bank had given way and made the embankment good with large quantities of dry rubble and sand.

It was inspected for the Board of Trade by Sir Frederic Smith, who found it "tolerably firm," but recommended careful watching. The rest of the line he found in good order and so sanctioned its opening, which took place on the 31st May 1841, the same day as the extension of the Great Western from Hay Lane to Chippenham. As far as the intended junction at Kemble the line was double, thence to Cirencester single, all composed of bridge rails weighing 54 to 60 lbs. to the yard on longitudinal timbers.

There were stations at Purton, Minety, and Cirencester, and Disc-and-crossbar signals had been set up.

Very soon after the opening the Swindon embankment again began to move. Fortunately the slips were confined almost entirely to the east side, so it was possible by using the Up line for bringing materials to keep the Down line open for traffic as a single line, worked by a pilot engine. In spite of Brunel's efforts, matters got worse in the autumn, the Up line subsiding several feet below the level of the Down, which, however, was still kept passable and in use. Early in December an excitable traveller wrote from Cheltenham to the Board of Trade: "I returned by the railway, and as far as Swindon all was very well, notwithstanding the wet, but from Swindon to Cirencester I was horrified at seeing the road I was passing over, and nothing shall tempt me to do it again. One line of rails has slipped for a mile or two completely away and the trains travel on the other line, which appears just hanging by a thread, and this on a precipice of 40 to 50 feet"!

The result of this was a visit of inspection by General Pasley, in January 1842, who, after observing on the gross exaggeration of the letter, and describing the embankment, reported as follows:

Fortunately the ground on the western side of the embankment remained firm, so that the slips took place on the eastern side only, where the clay, almost in a fluid state, gave way and moved towards the adjacent cutting, this movement taking place below the surface, as was proved by the remarkable fact that some very strong piles, which had been driven at the bottom of the embankment, were forced forward out of their original line, moving along with the clay; and in one part in particular some of them are now to be seen 70 feet in advance of their former position. This movement was described to me as having been very slow, so that if carefully watched, and men be stationed to

stop the trains, no danger can arise from it ; but it was so powerful on the east side that the ground under the rails there sank no less than three feet in 24 hours in the worst part.

To make good the embankment Mr. Brunel has caused soil of a better quality to be brought from a hill at the north end of it, and to be continually laid on the east side, using the rails on that side for the transport of this earth ; and, having found piling to be of little use, he has directed a dry wall of rubble stone, 12 feet thick, to be built at the bottom of the slope to the depth of 10 feet, which is equal to that of the cutting, as a retaining wall, to prevent the further movement of the base of his embankment towards the ditch or deep cutting on that side ; which, as a further precaution, he has ordered to be filled up opposite to those places where the greatest movement of the moist clay took place. These measures will, no doubt, prove effectual, for, as I said before, the western line of rails is perfect throughout, and the eastern line is now only about 15 inches lower than the other in the worst part, and is being gradually brought up to its proper level, which Mr. Brunel hopes to accomplish in four or five weeks.

The gallant General concludes his report by naively informing the Board that “ On my return from Swindon the rails were covered with snow, which had fallen continually during the day, and somewhat retarded but did not stop the progress of the train ” !

Beyond having made conditional contracts for the land required for the whole railway and let a contract for a heading through Sapperton Tunnel, the Directors had done nothing towards proceeding with the line from Kemble to Gloucester up to the end of 1841. From this time onwards their main object, with the apparent assent of the Proprietors, seems to have been to get rid of the whole undertaking and their responsibilities as quickly as possible. Hyett had resigned the Chairmanship in the summer of 1840, to be succeeded by his Deputy, Norwood Trye of Leckhampton Court, who had had enough of the thankless office by November and gave place to C. F. Sage of Gloucester.

In 1842 the Company obtained an Act authorising the sale or lease of the line to the Great Western, Birmingham & Gloucester, or Bristol & Gloucester Companies, and the raising of £750,000 additional capital; confirming the Swindon-Cirencester lease to the Great Western; allowing three years further time for completion of the railway; and enjoining the Birmingham & Gloucester Company to lay broad-gauge rails between Gloucester and Cheltenham at the cost of the Cheltenham & Great



SWINDON, *c.* 1850, VIEW FROM FOOTBRIDGE LOOKING WEST

Western in time for the latter's traffic when it should be open to Gloucester. This same Act gave the Bristol & Gloucester Company power to make the portion they required to use between Standish and Gloucester themselves, and to lay narrow-gauge rails thereon, subject to the right of the Cheltenham & Great Western to repurchase, in which event the former Company were to have perpetual running powers over it.

After the passing of this Act the Directors lost no time in opening negotiations with the Great Western Board for the sale of the undertaking. For some months the

latter would not consider anything beyond a lease of the line, when finished, with assistance in raising the necessary capital; but eventually in January 1843 they agreed, with the sanction of their shareholders, to buy the completed portion from Swindon to Cirencester and all the rights and powers of the Company, including that of repurchasing the moiety of the Gloucester-Cheltenham line and the tramway, for 3,000 Great Western half-shares of £50 each, fully paid, and £80,000 in cash. These terms were unanimously accepted by a Special Meeting of the unfortunate Cheltenham & Great Western Union Proprietors, held at the Company's Offices in Cirencester on the 14th February, and finally ratified in detail at another meeting in August.

The transfer took effect on the 1st July 1843. Thus for £230,000 additional capital the Great Western acquired the unfinished undertaking, on which the Cheltenham Company had managed to spend more than £600,000. A final Account of the latter, made up in December 1846, after all liabilities had been cleared off, shows that the shareholders received one Great Western half-share, worth in the market about £80, and seventeen shillings and sixpence cash for every two shares they held, on each of which they had paid up £83. Of the 5,693 existing shares the Great Western itself held 392; the rest of the original 7,500 had been forfeited for non-payment of calls.

The amalgamation of the two Companies was sanctioned by the Great Western Act of 1844, which also authorised an extension of a mile and a quarter from the end of the "joint" line at Lansdown Road to a station in the middle of St. James' Square in the town of Cheltenham, and confirmed the power of repurchasing

the moiety of that line from the Birmingham & Gloucester Company.



The Act of 1844, which confirmed the purchase of the Cheltenham & Great Western Union, also united the Oxford Railway Company with the Great Western. This Company never had more than a nominal existence, all its capital having been provided by the Great Western, and was finally dissolved by the Royal Assent to this Act on the 10th May, just a month before the opening of its railway. The act also defined the capital of the united Company at £6,120,000, with power to borrow on debentures £2,040,000, the usual one-third of the fixed capital, and legalised the loan notes, by means of which the Company had raised £1,593,950 without Parliamentary authority.

THE OXFORD RAILWAY

A "Probable Branch" of 12 miles to Oxford is shown on the map of the original Great Western Prospectus of 1833, but no steps towards making such a branch were

taken till three years later. The Directors' Report to the Half-yearly Meeting in August 1836 states: "A Branch to Oxford and a continuation of it to Worcester are promoted by the leading interests of those cities, and the best exertions of the Company will be devoted in co-operation with them to accomplish those objects."

We hear nothing more at this time of the continuation to Worcester, but a Bill for the Oxford Branch was promoted in the Session of 1837. As originally laid out, the line, starting from Didcot, approached Oxford by the Cowley Road to a terminus near Magdalen Bridge and threw off a short branch to Abingdon. The proposed terminus was strongly opposed by Christ Church as owners of the land, so Brunel altered it to a site near Folly Bridge, east of the Abingdon Road, with an alternative in St. Clement's. The University was pacified by clauses protecting the discipline of junior members and did not oppose, and the Bill had a peaceful passage through the Commons. In the Lords, however, it had a short shrift, the opposition of two landowners, Captain Pechell and Sir G. Bowyer, who owned $4\frac{1}{2}$ out of the total of $9\frac{1}{2}$ miles, being sufficient in that sanctuary of vested interests to stifle the project.

It was revived in 1838 without the Abingdon Branch—abandoned owing to the opposition of Mr. Duffield, M.P. for that borough(!)—but again defeated in the House of Lords. This year the University was the chief opponent, and its Chancellor, the Duke of Wellington, led the opposition.

After another abortive effort in 1840, Oxford was left in peace with its station 10 miles off at Steventon, to and from which eight coaches ran daily, taking an hour and a half on the journey for a fare of three shillings. We learn

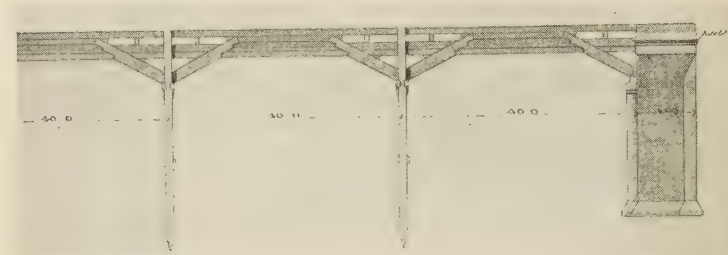
that in 1842 77,567 passengers and 12,620 tons of goods were dealt with at that station.

By the autumn of that year the bulk of the residents seem to have discovered that this method of travelling might be improved on, and the 1838 project was revived in preference to a suggestion of George Stephenson for a line from Moulsoford through Wallingford to Magdalen Bridge. Only two of the twenty-three members of the Hebdomadal Board, a committee formed of Heads of Houses which governed the University in those days, now opposed the railway, and of these two, the Warden of Wadham did so as Chairman of the Oxford Canal Committee. The Vice-Chancellor and the University generally were strongly in favour.

A Bill was accordingly deposited for the session of 1843 incorporating The Oxford Railway Company and authorising the construction of a railway from the Great Western at Didcot to "a certain field belonging to Brasenose College on the west of the Abingdon Turnpike Road in the Liberty of Grand Pont and Parish of St. Aldate in the City of Oxford and Counties of Oxford and Berks or one of them." Clauses for the preservation of University discipline provided that the Vice-Chancellor, Proctors or Proproctors, Heads of Colleges and Halls or their deputies, and the Marshal of the University should have free access to all stations at train times to ascertain if any members of the University were travelling or attempting to do so, and forbade the Company to convey any such members below the degrees of Master of Arts or Bachelor of Civil Law as should be pointed out by such officers for a period of twenty-four hours, even if their fares had been paid, or to take up or set down any members below these degrees except at the regular stations, under a penalty

of £5 for each offence. Power to sell or lease the line to the Great Western Company was taken, an early amalgamation being intended. The entire capital was put up by the Great Western in the names of ten of their Directors, there being no local shareholders.

Assents were obtained from all the landowners concerned, and the only petitions lodged in opposition were



SECTION OF FIRST NUNEHAM BRIDGE, 1844

from the Corporation of Oxford and some 300 inhabitants of the town, both said to have been organised by the Oxford Canal interest; to counteract these a petition in favour bore the names of 1,500 citizens.

The Bill had an uneventful passage through Parliament, and received the Royal Assent on the 11th April 1843.

Owing to difficulties in obtaining possession of parts of the land, work was not begun till October, but then proceeded rapidly through the exceptionally mild winter. The only engineering works of any importance were the bridges over the Thames at Appleford and Nuneham, and these were both constructed entirely of timber.

The whole branch, 9 miles 57 chains in length, was completed early in June, and on the 10th Major-General

Pasley, with Brunel and several Directors, came down to inspect it. The only fault the General had to find was the insecure state of the bridge carrying the Oxford-Abingdon turnpike road over the line. This brick arch with the road embankments approaching it had been left to the last moment for the curious reason given in General Pasley's report:



SECOND NUNEHAM BRIDGE, c. 1852

“Mr. Brunel explained to me that the haste with which this arch was built was caused by the conduct of an individual in possession of part of the ground over which the embankment was carried, who after the site of the bridge had been decided on, erected what he called ‘a house,’ which I saw but should never have guessed the use of, being a small hut of timber framework covered with *brown paper*, with a fireplace in it, for the purpose of claiming compensation from the Railway Company for having diminished the value of his property; and the work was delayed as this person's unexpected claim could not be settled until near the period of the entire completion of all other parts of the railway.”¹

Contenting himself with a direction that the old course of the road, crossing the railway on the level, should be maintained till the bridge and its approaches had been

¹ The tradition of this paper house was current in Oxford at the end of the century.

made good, the Inspector sanctioned the opening, which accordingly took place on the 12th June 1844.

On the same day a large junction station was opened at Didcot, consisting of four lines and five very narrow platforms under an "all-over" roof, which did duty till burnt down some forty years later.¹ Intermediate stations were established at Appleford, two miles from Didcot, immediately south of the first overbridge on the



DIDCOT STATION, *c.* 1850

branch, and "Abingdon Road," three miles from Didcot. The former was abolished early in 1849, and the latter re-named Culham on the opening of the Abingdon Branch in 1856.

The Oxford terminus was a wooden erection with a large goods shed beyond it, and the line was continued almost to the bank of the river. It ceased to be used for passengers on the opening of the new station

¹ On the 11th March 1885.

in 1852, but remained the Oxford Goods Station for another twenty years, after which it was finally abandoned and the land sold.



OXFORD OLD STATION, c. 1850

The Directors lost no time after the purchase of the Cheltenham & Great Western Union in proceeding to make the line from Kemble to Gloucester. There was need for hurry, as the power to buy back the moiety of the Gloucester-Cheltenham section from the Birmingham & Gloucester Company depended on its being completed from Swindon to Gloucester by the 21st June 1845; moreover, as we shall see in the next chapter, they had agreed with the Bristol & Gloucester Company to have the portion between Standish and Gloucester ready for their use by April 1844. The whole was let in four contracts, and work begun in August 1843. A year later $7\frac{1}{2}$ miles of the first of these had been finished as far as Standish and opened on the 8th July as part of the Bristol & Gloucester Railway; of the second, from

Stonehouse up the Stroud Valley to Sapperton Tunnel, about two-thirds had been completed and ballasted; of the third, limited to the tunnel itself, for which the heading and five shafts had been made by the Cheltenham Company, 650 yards out of 2,227 remained unfinished; while from the tunnel to Kemble the line was ready for the permanent way. By February 1845 the tunnel and all the principal works were completed and the permanent way was being laid.

Early in May the new line was inspected by General Pasley, who was accompanied by Brunel's resident assistants, R. P. Brereton and C. Richardson. His report to the Board of Trade describes the tunnel.

The south entrance of the Sapperton Tunnel is 3 miles 71 chains from Kemble¹ in a cutting 47 feet deep. After a short portion of tunneling, on an ascending gradient of 1 in 95, 16 chains in length, is an open cutting of 3 chains in length on a level; after which the remainder of the tunnel, about 81 chains in length,² follows on a descending gradient of 1 in 90, except a short portion at the north end, which descends by a steeper gradient of 1 in 60. The whole length of the tunnel including the short cutting at the summit level is 2,212 yards, or rather more than $1\frac{1}{4}$ mile; about 80 yards at the north end of which are on the steeper gradient, and here the tunnel, which before was straight, has been laid out on a curve of 36 chains radius. At its north end it emerges in a cutting 64 feet in depth.

This tunnel has been cut through rock of the great and inferior oolites and fuller's earth formation, with shale and beds of shelly limestone. The rock being of an unsound quality with many wide and deep vertical and horizontal fissures, partly filled with clay or earth, it was deemed necessary to line it with masonry and brickwork throughout. The arch is a curve resembling an oblong

¹ This distance would make "Kemble" 20 chains east of the present station.

² The two tunnels are actually 353 and 1,855 yards long.

segmental ellipse, of which the greatest span is 28 feet at the height of 7 feet above the rails, diminishing to 27 at that level. Part of it, 443 yards, has been formed with an inverted arch, of which the span is 27 feet at rail level, with a versed sine of $2\frac{1}{2}$ feet. The side walls and invert are of masonry and generally 2 feet thick, while 20 feet in width of the upper part of the arch have been built with brickwork varying in thickness from 18 to 27 inches, that is from two to three bricks thick. Ten shafts were opened in making the tunnel, all of which have been blocked up except one only in the middle of the long portion.¹

From the tunnel the railway runs for seven miles with many curves down the Golden Valley, following the course of the Thames & Severn Canal, to Stroud. In this distance there were nine timber viaducts,² described by General Pasley as follows:

Distance from Kemble M. C	Name	Description
5.54	Frampton	Twelve 30 feet spans,
6.65	Slip ³ . .	Twenty-two 30 feet spans,
7.61	St. Mary's	One span over the Canal of 75 feet on the skew,
8.48	Bourne . .	One span over the Canal of 67 feet on the skew, and sixteen others varying from 30 to 18 feet,
10.60	Capel's . .	Eighteen 30 feet spans,
10.68	Canal (in continuation of the above)	One span over the Canal of 51 feet on the skew and three others of 30, 28, and 22 feet,
11.21	Watt's . .	Eight 30 feet spans and four stone arches,
11.31	Stratford .	One 40 and seven 30 feet spans,
12.10	Cainscross	Four 32 feet spans.

¹ There are now 4 shafts.

² From 1859 onwards they were gradually reconstructed with more durable materials.

³ So called from a landslip which had occurred there some years before the railway was made.

After passing Stroud the line curves northward through Stonehouse to Standish, whence it runs almost due north to Gloucester.

There were four intermediate stations—Tetbury Road, Brimscombe, Stroud, and Stonehouse—"all handsome stone buildings."¹ At Gloucester the Company had as yet only a temporary station, and that not their own, made by adding a platform to the north side of the terminus of the Birmingham & Gloucester Railway, which the Great Western crossed on the level just outside the station. This platform had, of course, been used by the Bristol & Gloucester Company's trains since the opening of their line in the previous July. With the Inspector-General's sanction, the 15½ miles from Kemble to Standish Junction, completing the line from Swindon to Gloucester, were opened on Whit Monday, the 12th May 1845.

Although the extension from the Lansdown Road into the town of Cheltenham had been begun early in 1844, and was by this time in a forward state, no attempt was made to open the broad-gauge line beyond Gloucester. In August the Directors reported:

The repurchase has been made of the moiety of the Line between Gloucester and Cheltenham, and the amount claimed has been paid or invested under the provisions of the Acts of Parliament relating thereto within the time prescribed; but the Directors have not thought it desirable yet to complete the line into Cheltenham, or to build the Station there, in consequence of the new Railway contemplated between that Town and the Oxford and Worcester Railway at Shipton under Wychwood, which would probably render the intermediate outlay on any buildings unprofitable, at all events until the future plans can be more distinctly defined.

¹ Chalford was added in 1897.

Nothing was done for two years, when, the Shipton and other schemes having been laid to rest and disputes with the Midland Railway Company, who, as we shall see, had become possessed of the whole line between Birmingham and Bristol, settled, the Directors announced that they "intended to work Great Western trains over the new line into Cheltenham in the course of next month, the rails for the Broad Gauge being already laid between Gloucester and Cheltenham, and the Station at the latter place nearly completed."

As this was the first important instance of a mixed-gauge railway, the following extracts from Captain J. L. Simmons' report to the Railway Commissioners of the 15th October 1847 are of interest.

On Monday last, the 11th instant, I inspected the double gauge line of railway from Gloucester to Cheltenham, as also the broad gauge extension into the latter town, and a short piece called the "Avoiding Line" at Gloucester.

Additional rails have now been laid from Cheltenham to Gloucester, uniting the gauges in one line of railway, and a connexion on the broad gauge has been made between the two lines leading into Gloucester Station called the "Avoiding Line," thus throwing Gloucester off the direct line from London to Cheltenham by about half a mile.

The station arrangements at Gloucester will remain the same, as far as the separation of the two gauges is concerned, but the broad gauge to Cheltenham unites with the narrow gauge immediately outside the Station, the Down line to Cheltenham being laid with three rails throughout up to the point of separation of the gauges near that town, the Up line being laid with four rails as far as the junction with the Avoiding Line, from which point to the point of separation near Cheltenham it is likewise laid with three rails.

This point of separation is called the "Cheltenham Junction"; the junction of the Avoiding Line with the line from Gloucester to Cheltenham is called the "Barnwood Junction"; and the point of meeting of the Avoiding Line with the Bristol and London line is called the "Millstream Bridge Junction."

The combination of the gauges, where three rails have been used for both, has been effected by laying an additional rail out-

side each line of the narrow gauge, as if the latter had never been disturbed, so that carriages of either gauge may have a complete road, it not being contemplated to unite carriages of both gauges in one train, which for many reasons would be extremely dangerous and ill advised, but merely that each kind of stock should be able to work separately over the same ground. Between the Cheltenham and Barnwood Junctions there is no station and only one "through crossing," constructed for the narrow gauge only, so that the mixture of gauges causes not the slightest complication or difference as regards the running of the trains of either gauge between these points.

The permanent way where the gauges are combined is laid with transverse sleepers, $11\frac{1}{2}$ feet long, 12 inches broad by 6 deep, 3 feet apart, having chairs fixed to them by fang bolts, those to carry the joints of the rails weighing $60\frac{1}{2}$ lbs. each, and the others 32 lbs. The rail weighing 83 lbs. to the yard has a large upper flange and a small projection below to secure it, the fastening being by a timber wedge. Where the gauges are not combined or intermixed, the permanent way is of the same description as that adopted generally by Mr. Brunel, and used upon the Great Western and other broad gauge railways.

The junctions were peculiar, and are described at great length by the Inspector.

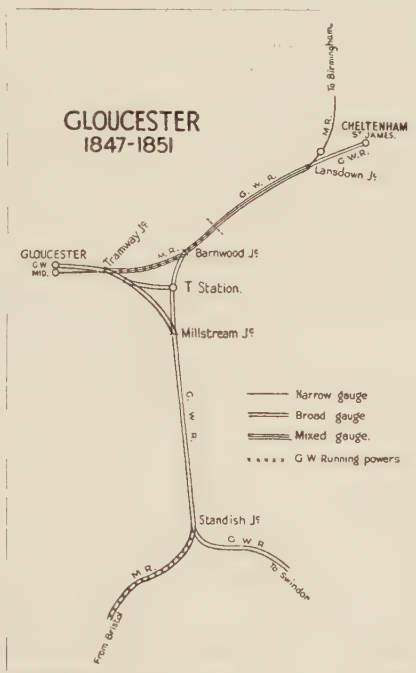
On the Down line from Gloucester, the Barnwood Junction, where the broad-gauge Avoiding Line came into the mixed-gauge from the right, was formed by ordinary trailing points in the common and broad-gauge rails, there being no point in the middle narrow-gauge rail; at the Cheltenham or Lansdown (as it was even then generally called) Junction, where the Broad Gauge diverged to the right, there were no movable points at all, but only a fixed facing point in the common right-hand rail and a guard-rail inside the left narrow-gauge rail to draw the wheels of the narrow-gauge stock to the left of the fixed point, its operation being assisted by the same middle rail being lowered three inches, while the outer broad-gauge rail was raised three inches to throw the broad-gauge wheels to the right of the point.

On the Up line from Cheltenham, the union of the gauges at Lansdown Junction was effected merely by a single movable trailing point in the common right-hand rail; Barnwood Junction was still more peculiar—first, the Broad Gauge diverged to the left by means of a fixed facing point in the common rail as on the Down line at Lansdown, only that

here it was the broad-gauge outer rail that was lowered and had the guard-rail while the narrow-gauge rail was raised; then, a few feet beyond the fixed point and while the right rail of the Broad Gauge was still between the two narrow-gauge rails, there were ordinary double facing points in the Broad Gauge to turn trains either along the Avoiding Line or towards Gloucester Station; in the latter direction

there were then four rails, the right-hand broad-gauge rail continuing between those of the Narrow Gauge for several hundred yards till the Broad Gauge diverged to the left, of course without any points, and then swept round to the right to join the line from Swindon just east of the level crossing of the two railways.

These junctions were of course ordered to be passed



at a slow speed—at first the limit was 8 miles an hour. Similar fixed-point junctions to that described at Lansdown, with some slight improvements, were afterwards installed at all places where the two gauges diverged from a mixed-gauge line, and were used for many years without any recorded accident.

The Millstream Junction at the south end of the Avoiding Line was an ordinary one, all lines there being broad-gauge only.

The Great Western trains began to run to their station in St. James' Square, Cheltenham, on the 23rd October 1847.

The Inspector alludes in his report to “the new broad gauge station, which is to be on the Avoiding Line.” This station was built at the point where a short single line from Gloucester Station crossed the Avoiding Line at right angles, connecting with it by means of a turn-table in each of the running lines, and terminating in a short dead end beyond. Hence it came to be known as the “T Station,” and the short single line as the “T Line.” As soon as these were ready for use, the Swindon trains were arranged to run direct to and from Cheltenham, calling at the T Station, and a shuttle service was run on the T Line from and to Gloucester Station to connect with them there, the through Gloucester vehicles being transferred by means of the appropriate turn-table. The Enginemen's Rule Book of 1848 contains the following rule:

All trains passing along the Main (or Avoiding) Line at Gloucester must stop before reaching the Turn-table, unless the Engineman sees that the T Line Engine has gone across and is standing on the opposite side of the line, and unless he also receives the Signal from the Policeman.

This quaint method of working the Gloucester traffic continued till the railway westward from Gloucester was opened in September 1851, after which the T Station and the Avoiding Line fell out of use and lay derelict for many years.¹ In addition to the local service via the T Station, the Great Western from the first ran some



THE OLD T STATION HOUSE, GLOUCESTER

“short trains” direct between Gloucester Station and Cheltenham.

The curious arrangement as to the ownership of the railway between Tramway Junction, Gloucester, and Lansdown Junction, Cheltenham, made by the Acts of 1836-44, still survives, save that the Great Western are no longer trustees of the southern portion. On their repurchase of the Cheltenham & Great Western Union Company's rights in 1845 they became the legal owners of

¹ The T Station House may still be seen, and the adjacent sidings are known to this day as “Gloucester 'T Sidings.” The old Avoiding Line was reopened as the “Cheltenham Loop” in 1901.

the whole line, but, as regards the half nearer Gloucester, only as trustees for the Midland Company. This lasted till 1867, when a long-standing lawsuit between the Companies as to property and rights in the Gloucester district came at last to an end, and as one of the results,¹ the Great Western conveyed this southern half to the Midland. The northern half from the Halfway Post, just south of Churchdown Station, to Lansdown is their absolute property, as well of course as the whole extension into St. James' Square Station. Each Company has free use of the other's half without payment of tolls, and each keeps its own half in repair for the common benefit.

Having made this excursion into the future in order to complete the story of the Cheltenham Branch, we will now return to the year 1844.

On the 1st May the Bristol & Exeter Company completed their railway to Exeter, thereby giving the Great Western a main line of nearly 194 miles, longer far than that of any other Company in the Kingdom. Gooch gives his recollection of the opening in his *Diaries* :

We had a special train with a large party from London to go down to the opening. A great dinner was given in the Goods Shed at Exeter Station. I worked the train with the "Actaeon" engine, one of our 7 feet class, with six carriages. We left London at 7.30 a.m. and arrived at Exeter at 12.30, having had some detention over the hour fixed. On the return journey we left Exeter at 5.20 p.m. and stopped at Paddington platform at 10. Sir Thomas Acland, who was with us, went at once to the House of Commons, and by 10.30 got up and told the House he had been in Exeter at 5.20. It was a very hard day's work for me, as,

¹ Another result was the conveyance by the Midland to the Great Western of a considerable part of the land on which the latter's Gloucester Station stood.

apart from driving the engine a distance of 387 miles, I had to be out early in the morning to see that all was right for our trip, and while at Exeter was busy with matters connected with the opening, so that my only chance of sitting down was for the hour we were at dinner. Next day my back ached so that I could hardly walk. Mr. Brunel wrote me a very handsome letter, thanking me for what I had done, and all were very much pleased.

At this time a Bill was before Parliament for a broad-gauge railway in continuation of the Bristol & Exeter from Exeter to Plymouth, to be made by a new company, to which the Great Western had agreed to subscribe £150,000. Two months later it received the Royal Assent and the South Devon Railway Company came into being, Russell and two of his colleagues representing the Great Western on its Board.

The general extension of railways in all parts of the country, which soon developed into the Railway Mania, was now beginning. Their utility was recognised; money was plentiful; and many of the established companies were paying good dividends, ten and even more per cent. in several cases.

Companies were formed in the course of 1844, with Great Western assistance, to make the following broad-gauge lines:

The South Wales Railway, from Standish on the Cheltenham Branch through Chepstow, Newport, Cardiff, and Neath, and by Swansea and Carmarthen to Fishguard, with branches to the Forest of Dean, Pembroke, and from Newport to Monmouth; in all 211 miles.

The Cornwall Railway, from the South Devon at Plymouth to Falmouth; 66 miles.

The Wilts, Somerset & Weymouth Railway, from near Chippenham through Frome, Yeovil, and Dorchester to Weymouth, with branches to Devizes, Bradford, Salisbury, Radstock, Sherborne, and Bridport; in all 148 miles.

The Oxford, Worcester & Wolverhampton Railway, whose title is sufficiently descriptive, with some short branches; $97\frac{1}{2}$ miles.

The Great Western Company itself promoted the following lines by means of subsidiary companies, as in the case of the Oxford Railway, providing the necessary subscription capital in the names of some of its Directors.

The Berks & Hants Railway, forking from Reading to Basingstoke and through Newbury to Hungerford; 39 miles.

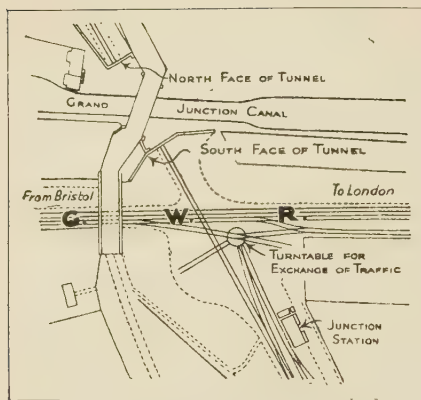
The Oxford & Rugby Railway, through Banbury, Fenny Compton, and Southam; 51 miles.

The Monmouth & Hereford Railway, from Standish across the Severn at Framilode to Westbury and thence by Longhope, Walford, Ross, and Holme Lacy to Hereford, with a branch from Walford to Monmouth, there to join the South Wales branch from Newport, and another from a point in the Parish of Lea, north of Mitcheldean to join the other South Wales branch in the Forest of Dean; altogether 45 miles.

To connect the last-named railway with Gloucester, a company entitled the Gloucester & Dean Forest was projected locally, but, being reported against by the Board of Trade, was dropped for this year.

The Wilts, Somerset & Weymouth; Oxford, Worcester & Wolverhampton; Berks & Hants; and Oxford & Rugby were all projects over which the opening campaigns of the Gauge War were fought, and will be dealt with more fully in the next chapter, while the stories of the South Wales and Oxford, Worcester & Wolverhampton Companies, during their eighteen years of independence will be told later, when they eventually became parts of the Great Western. Here it is enough to say that Acts for all the railways named above, except the Cornwall, were obtained in the Session of 1845, but the South Wales and Monmouth & Hereford undertakings were confined by Parliament to the north side of the Severn, objections to the proposed bridges over the river being upheld, which of course cut them off from connection with the Great Western for the time.

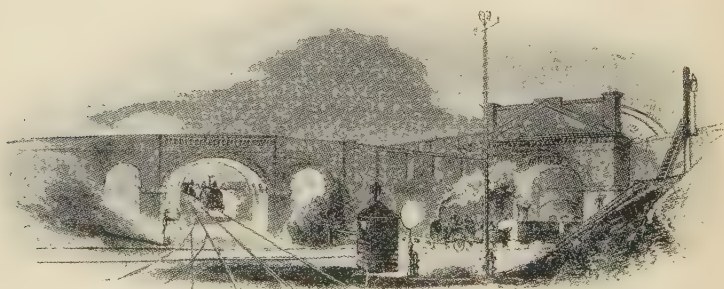
The Great Western forthwith took over its three creature Companies, the Berks & Hants, Oxford & Rugby, and Monmouth & Hereford, and next year obtained an Act for their absorption. To connect the last named with their own system at Gloucester the Directors arranged with the promoters of the Gloucester & Dean Forest project to apply for an Act to carry it out, agreeing to take a long lease of their line on favourable terms, and to subscribe £50,000 capital. Another Act of 1845 authorised the leasing by the Great Western and London & Birmingham Companies jointly of the West London Railway. This was our old friend the Birmingham, Bristol & Thames Junction of 1836 under a new name adopted in 1840, which, starting from the London & Birmingham line near Kensal Green, crossed the Great Western on the level with a siding connection, and terminated at the Kensington Canal



PLAN OF WEST LONDON CROSSING
1844

Basin.¹ The Company had experienced all sorts of difficulties in getting its little railway finished. A short piece of it by Wormwood Scrubs had at one time been used by Messrs. Clegg and Samuda for experiments with their Atmospheric system of traction, of which we shall have more to

say hereafter in the story of the South Devon Railway. At last it was opened as a single line on the 27th May 1844, and a half-hourly service of passenger trains arranged. Some of these connected with Great



WEST LONDON CROSSING 1844

¹ Corresponding nowadays to a point not quite half a mile south of Addison Road Station.

Western trains at the crossing, where a small station¹ was made by the West London Company, but the service was not a success and was wholly discontinued at the end of November. From the Great Western crossing southward the single line was laid with three rails for the Mixed Gauge, but it does not appear to have been used by broad-gauge trains until the line had been doubled and reopened in 1863.

The Great Western Company was singularly unfortunate in the session of 1846, as far as schemes of its own promotion were concerned. Apart from the Gauge War projects described in the next chapter, these were only for short branches, one of them evidently intended to found a suburban traffic in the Thames Valley:

From Ealing through Brentford and Isleworth, and between Twickenham and Hounslow to Staines.

From Twyford to Henley.

From Twerton to the Collieries between Timsbury and Radstock.

On the other hand, Bills for the following lines, in which the Company was interested, were duly passed.

The Gloucester & Dean Forest Railway, from the Great Western at Gloucester to the Monmouth & Hereford in Westbury-on-Severn, and on to meet the South Wales Railway at Hagloe Farm beyond Awre; 15 miles.

The Cornwall Railway, from Plymouth to Falmouth, with branches from near Doublebois through Bodmin to Padstow, to the Liskeard and Caradon Railway, and to the quays at Truro and Penryn; altogether 81 miles.

¹ The little station house is still standing just south of the Great Western main line.

The West Cornwall Railway, from Truro to Penzance with branches; 31 miles.

The Wycombe Railway, from Maidenhead to High Wycombe; 10 miles.

The Great Western & Uxbridge Railway, from West Drayton to Uxbridge; $2\frac{1}{2}$ miles.

The last three were promoted locally without any assistance from the Great Western, who, however, afterwards agreed to buy the Wycombe and Uxbridge undertakings, and obtained an Act for the purpose in 1847. This purchase was never carried out, because the two Companies were unable to raise the half of their capital required by law to enable them to sell, so the powers lapsed.

In the next session the Company succeeded in getting power to make the Henley and Radstock Branches, and also one from Acton to the West London Railway, and to extend the latter to join the South Western at Vauxhall and make a branch from it to Hammersmith; but their suburban ambitions, now centred on a line from Acton to Staines and Egham, with branches to Brentford, Isleworth, and Twickenham, were again defeated, and those townlets delivered to the South Western enemy, who was authorised to invade Middlesex and even assault the Royal Borough of Windsor.

From one cause or another the Great Western had always been unsuccessful in their efforts to reach Windsor. At last in 1848 they got their Act for a forked branch "from two points on the Great Western Railway near the western station at Slough" to Windsor. It bristles with provisions for the protection of Eton College: screens or planting to be provided to ensure the privacy of the

Bathing Place; the Thames Bridge to have a clear waterway to the satisfaction of the Provost and Head Master; Provost and all Masters to have free access to the station to find any scholar, "whether on the Foundation or otherwise"; Police along the line to prevent access of scholars;¹ in default, the College may appoint two at the expense of the Company; all such bridges as the College may require for passage to bathing places or other places of amusement and to carry flood water to be provided;



WINDSOR BRIDGE

no intermediate station or buildings to be erected *or passengers or goods taken up*² without consent of Provost and College under their common seal; special constables during construction to control workmen subject to the orders of the College; penalties for defaults, and their recovery by the College.

The branch was begun at once, and pushed on with quite unusual speed. The chief works were a long timber

¹ One man at least was employed for this purpose till October 1886, when the then Provost, Dr. Hornby, agreed to his withdrawal on condition he was reinstated if required.

² They were not to be caught a second time!

viaduct¹ and the Thames Bridge, one span of 202 feet, formed of three bow-and-string girders supported at each end on six cast-iron cylinders filled with concrete. Although the station was by no means complete, the branch was opened for traffic, together with the west fork at Slough, on the 8th October 1849, two months before the enemy invaded the town from the other side.

As might be expected, more capital was required for the completion of the Cheltenham and Oxford Branches and to meet all these new engagements, so in August 1845 it was decided to raise £2,325,000 by the issue of 93,000 quarter shares of £25 each, to be offered in the first instance to existing shareholders. A year later £1,185,000 was raised in shares of the curious amount of £17 each, bringing the share capital up to £8,160,000, and at the same time more debentures were authorised, making a total of £3,236,666 borrowed.

¹ Reconstructed in brick 1861-65.

CHAPTER VI

THE GAUGE WAR

1. *General Summary.*

Popularity of the Broad Gauge—English Expresses in 1848—Extent of Conquests—Gradual Decay.

2. *Bristol & Gloucester Railway.*

Early History—Adopts Broad Gauge—Opened—Break of Gauge—Bristol & Birmingham Company—Great Western Offer—A bold Quaker—Capture by the Enemy.

3. *Oxford & Rugby, and Oxford, Worcester & Wolverhampton Railways.*

Origin—Condemned by the “Five Kings”—A Great Battle—Help from the North—Birth of the London & North Western Railway—Victory.

4. *The Gauge Commission.*

A Cloud of Witnesses—Report—“Observations” thereon—The Case for the Broad Gauge—Board of Trade View—Gauge Act.

5. *Birmingham & Oxford Junction, and Birmingham, Wolverhampton & Dudley Railways.*

Origin—Bills passed—Narrow Gauge—Sale to Great Western—Civil War—The Euston Troupe—Forgery—Chancery—Another Battle—Brunel and Stephenson—Timid Commissioners—Victory—Spite—Duddeston Viaduct—Wolverhampton Junction Railway—Farthest North.

6. *The Fight in the South.*

Preliminary Skirmish—Southampton & Dorchester—A Treaty—Berks & Hants, and Wilts & Somerset—Exeter Great Western—Treaty Broken—Stalemate—Two New Lines to Exeter—Neither made—Progress of Wilts & Somerset—The Divided Enemy—Devon & Dorset Railway—Defeat—A Broken Pledge.

1. GENERAL SUMMARY

WHAT has usually been called the "Battle of the Gauges" was really a long war, lasting some ten years from the first meeting of the two gauges at Gloucester in 1844. During the war many battles were fought on different fronts with varying results before the Broad Gauge Forces were at last defeated by the mere multitude of their enemies.

The first of these was a short and sharp engagement over the body of the Bristol & Birmingham Railway, resulting in a victory for the Narrow Gauge. Later in the same year a long and hard fought contest gave the Broad Gauge lines from Oxford to Rugby and through Worcester to Wolverhampton, and raised hopes of its conquering even Liverpool and Manchester. But this victory and the inconvenience of the break of gauge at Gloucester, now made generally notorious and much exaggerated by the enemy in possession, led to the appointment by the Government of a Royal Commission to investigate the merits of the rival gauges, and the expediency of enforcing uniformity throughout the country.

A long struggle ensued, lasting through the autumn and winter of 1845, and resulting in the Report of the Commissioners, which, while admitting the superior capabilities of the Broad Gauge for speed and hauling heavy loads, was generally in favour of the Narrow as best suited to the general traffic of the country, and even went so far as to recommend that equitable means should be found of establishing uniformity by the compulsory extinction of the Broad Gauge.

The course of events has shown that it would have been much to the ultimate advantage of the companies

concerned, though not of the public, had this recommendation been carried out at the time when less than 280 miles of broad-gauge railway were open, but the "equitable means" were not forthcoming. It was felt that the companies could not fairly be called upon to bear the expense of altering their lines and rolling stock from the gauge they had been allowed or even authorised by law to adopt, and the Government naturally enough declined to provide any public money for the purpose. Moreover, the Commissioners had been far too ready to accept the mere oft-repeated assertions of interested witnesses as facts, and the Broad Gauge party had little difficulty in showing that many of their conclusions were based on errors.

Hence the Report was not adopted in its entirety by the Government or Parliament. Though the House of Commons passed a series of resolutions in favour of the general enforcement of the Narrow Gauge in future, the Gauge Act of 1846, which was the outcome of the whole business, excepted from this general rule any new railway whose gauge should be defined by its special Act, and so left matters, as far as the law was concerned, much as they had been before the agitation began. However, it cannot be denied that the result of the Commission was a distinct check, though by no means a decisive one, to the extension of the Broad Gauge.

The controversy was one of the public topics of the day, and a wordy warfare raged in pamphlets, newspaper articles, and even books. The general public, in the south at any rate, were strongly in favour of the Broad Gauge with its large, comfortable, and smooth running carriages, and its express trains, far faster and more punctual than those on the other lines, and, moreover, taking second

as well as first-class passengers—the so-called expresses on the narrow-gauge lines took only first, and the London & North Western even limited the numbers of these. This popularity of the Broad Gauge was the cause of no little anxiety to the other party, and they did their best to counteract it. The late Sir Henry Cole tells us in his autobiography¹ that he was employed by the London & North Western Company “to create a public opinion” in favour of the Narrow Gauge, and gives details of the pamphlets he caused to be published for the purpose. But fast and comfortable trains were stronger arguments than bushels of pamphlets, and the Great Western continued in general favour. The table on page 203, extracted from the “Report of the Commissioners of Railways on Railway Communication between London and Birmingham, 1848,” gives an interesting comparison of the speeds of the English express trains of this period.

Consequently, after yet another protracted inquiry and a bitter fight with the London & North Western, the Great Western were victorious in 1848 in obtaining power to extend the Broad Gauge to Birmingham and Wolverhampton by means of the Birmingham & Oxford Junction, and Birmingham, Wolverhampton & Dudley Railways, two narrow-gauge lines of 1846 purchased by the Company.

This was the last victory. Hard times set in, and though the war-cry of “The Broad Gauge to the Mersey” was raised in the early 'fifties on the acquisition, after more desperate fighting, of the Shrewsbury & Birmingham and Shrewsbury & Chester lines with their powers

¹ *Fifty Years of Public Work* by Sir Henry Cole, K.C.B. 2 vols. 1884.

TABLE OF RATES OF TRAVELLING OF EXPRESS TRAINS

Computed from Bradshaw's Time Tables for the Month of May 1848

In the column headed "Rate excluding Stoppages" an allowance of five minutes has been made for each stoppage at stations in addition to the actual delay allowed by the Time Tables, and the stopping and starting at the termini have been considered as equivalent to one ordinary stoppage.

Name	From	To	Distance		Stoppages	Delays	Time	Rate		Remarks
			Miles	No.			Hrs. Min.	including	excluding	
Great Western	{ London London	Swindon . .	77	2		—	1 25	Miles 54.35	Miles 61.60	Ming. Exp. A'noon Exp.
		Exeter . .	193 $\frac{3}{4}$	7		15	4 30	45.58	52.84	
London and North Western	London	Liverpool .	201	14		—	6 45	29.77	36.00	
		Edinburgh .	377 $\frac{1}{4}$	6		—	5 45	34.95	38.28	
London and North Western and Midland, etc.	London	Edinburgh .		13		60	12 25	33.04	36.50	
London and South Western {	London	Southampton	78	3		—	1 45	44.57	52.00	
		Portsmouth	88	4		—	2 10	40.62	48.00	
South Eastern	London	Dover . . .	88	8		—	2 30	35.20	48.00	
		Brighton . .	50 $\frac{1}{2}$	4		—	1 30	33.66	43.28	
London, Brighton, and South Coast	London	Brighton . .								
Eastern Counties and Norfolk	London	Norwich . .	126	11		10	4 35	28.52	36.00	

over the Chester & Birkenhead, the Act of 1854 sanctioning this amalgamation specially forbade any extension of the Broad Gauge north of Wolverhampton, and enforced the completion and working of the Narrow Gauge throughout from Wolverhampton by Oxford to Basingstoke. As early as 1846 the Company had pledged itself to complete this chain of narrow-gauge communication from north to south, in order to defeat rival schemes.

Moreover, in 1851 the Broad Gauge was stabbed in the back and its ultimate defeat hastened by the mutiny of the Oxford, Worcester & Wolverhampton Railway, for whose very existence the first fierce battle of 1845 had been fought. This rebellious daughter, in spite of Acts of Parliament and agreements, actually went over to the enemy, and though compelled to lay down broad-gauge rails laid narrow with them, and used the latter only. The story of this mutiny is told elsewhere. Here it will suffice to say that when the prodigal, after ten years in the wilderness, at last returned home, she succeeded in forcing the Narrow Gauge into the very citadel of Paddington.

While these battles were being fought on the northern front, warfare was also being carried on with the other enemy in the south. After a preliminary indecisive skirmish in 1844, a treaty was signed, and broad-gauge lines to Basingstoke, Hungerford, Salisbury, Yeovil, and Weymouth sanctioned in the following year. The next season saw the treaty broken by the enemy, and the beginning of the struggle for the country between Salisbury and Exeter. Neither side was victorious, and the country remained unoccupied. Then, after a campaign lasting over 1847 and 1848, it was captured by the

Narrow Gauge and the Great Western attack utterly defeated. The Broad Gauge Forces, however—the Bristol & Exeter Company had joined in the fray on its own account—got some consolation in the power to make a direct line to Exeter by almost the exact route adopted nearly sixty years later. Owing to the extreme scarcity of money at this period, none of the lines so authorised was made by either side, and the powers lapsed. When times became somewhat brighter four years later, the Broad Gauge Allies determined on another assault on the still vacant district in Dorset and Devon, but were once more defeated in the session of 1853, and then finally abandoned the fight. This defeat was expressly on the question of gauge, the House of Commons Committee preferring for reasons of national defence a narrow-gauge line, continuous with that along the coast from Dover and Portsmouth, which the enemy pledged themselves to make forthwith. But, having obtained their object, they again broke their word, and made no attempt to redeem the pledge until compelled by Parliament to do so three years later.

In the far west also there was strife between the gauges for possession of the country beyond Exeter. In this the Broad Gauge Forces, represented not by the Great Western, but by the allied Bristol & Exeter and South Devon Companies, were for the time victorious. Some account of this local war will be found in the stories of those two railways.

By the end of 1854 the general war was over, though the fight with the mutinous Oxford, Worcester & Wolverhampton Company lasted nearly four years longer. The Great Western itself was no longer a purely broad-gauge railway, having become possessed of

some 80 miles of narrow-gauge lines north of Wolverhampton, which it was expressly forbidden to widen. Two years later the Mixed Gauge was completed from the north to Basingstoke, and the portent of narrow-gauge goods and mineral trains appeared on the main line in the Thames Valley. Moreover, the Broad Gauge cause suffered a heavy blow in the summer of 1855 by the retirement of its most powerful champion, Charles Russell, from the Chairmanship of the Great Western Company, which he had held for sixteen years. The next ten years saw a succession of no less than six short-lived Chairmen. In 1858 the Directors at last gave way to the Oxford, Worcester & Wolverhampton, and agreed to their release from the statutory obligation to complete their line as a broad-gauge railway. This was followed three years later by the extension of narrow-gauge rails from Reading to Paddington, chiefly to secure that Company's traffic, but also to obviate the break of gauge, which almost annihilated through goods traffic between London and the Great Western's own line north of Wolverhampton. These were, however, for several years used only by the few through trains to the Northern and West Midland districts, all others remaining broad-gauge.

The Great Western as yet manifested no intention of abandoning its distinctive gauge, though the ultimate necessity of this must have been foreseen. New branches and extensions, of no great length it is true, continued to be opened, 22 miles of them as late as 1864. In London itself, the costly Metropolitan Railway from Bishop's Road to Farringdon Street was opened as a broad-gauge line in 1863, and the same year saw broad-gauge trains in Victoria Station.

By the end of 1866 the broad-gauge rails ran from

Paddington to Penzance, Milford Haven, Hereford, Wolverhampton, and Weymouth, and there were either open or under construction no less than 1,040 miles of broad and 387 of mixed-gauge lines, of which the Great Western owned or worked 592 and 240 miles respectively besides 462 miles of narrow-gauge. Breaks of gauge occurred at more than thirty places.

As we shall see, the gradual extinction of the Broad Gauge, as far as the Great Western was concerned, had by this time been decreed. Financial reasons, however, prevented any serious steps being taken till 1869. Six years later it had disappeared, except on three short branches and the main line to Bristol, where it was retained solely for the through traffic to and from the west. When the railways in the west were taken over in the following year, the Narrow Gauge had just reached Exeter. There it stopped for sixteen years till the South Devon and Cornish lines were altered and the Broad Gauge finally abolished.

But we are anticipating, and must now return to the outbreak of the war and give some account of the hard fought battles which failed to prevent the accidental gauge of the Northumberland colliery tramways being established on all the railways of England.

2. THE BRISTOL & GLOUCESTER RAILWAY

The first so-called railway to be made in the neighbourhood of Bristol was a line from a point called Cuckold's Pill on the Floating Harbour, now known as Avon Street Wharf, through St. Philips and by Lawrence Hill, Fishponds, and Mangotsfield to the Collieries at Shortwood, Parkfield, and Coal Pit Heath. It was authorised by an

Act obtained in June 1828, and entitled The Bristol & Gloucestershire Railway. The line, some ten miles long, was single of a gauge of 4 feet 8 inches, and formed of fish-bellied rails fixed by means of iron chairs to square stone blocks. It was opened throughout on the 6th August 1835, and was worked by horses and gravity, the gradients being with the load practically all the way. Needless to say, its sole object was the conveyance of coal to Bristol.

A similar though independent line from the River Avon opposite Keynsham, joined the Bristol & Gloucestershire Railway at a point $5\frac{1}{4}$ miles from Bristol, now Mangotsfield North Junction, and ran over it to Coal Pit Heath. This was the Avon & Gloucestershire Railway, belonging to the Kennet & Avon Canal Company, who used it to bring coal to Bath and places east thereof, as well as down the river to Bristol. It also was authorised by an Act of 1828, and opened, together with the Bristol & Gloucestershire north of the Junction, in July 1832.

These undertakings had not been at work many years when proposals were made in Bristol for forming a railway between that City and Gloucester by extending the Coal Pit Heath line to join the Cheltenham & Great Western Union near Stonehouse, and adapting the former for locomotives. A company for this purpose was promoted and, after an unsuccessful attempt in 1838, an Act obtained in the following year authorising an extension, some 22 miles in length, of the Bristol & Gloucestershire Railway from Westerleigh, about 2 miles short of Coal Pit Heath, to a junction with the Cheltenham & Great Western at Standish, and the alteration of the existing line and ultimate absorption of its Proprietors in the enlarged Company entitled the Bristol & Gloucester

Railway Company. At this time the gauge of the railway had not been decided, but at the General Meeting held at Bristol on the 31st March 1840 the Directors reported that it appeared to them "essential to the interests of the undertaking that the Line should be constructed of the same gauge as that of the Railway from Gloucester to Birmingham. On this Line the narrow gauge has been adopted." They added that they had been negotiating with the Cheltenham & Great Western Company for the laying of additional rails for the continuation of the Narrow Gauge from Standish to Gloucester. This matter had, however, been superseded by a proposal emanating from the Birmingham & Gloucester Company for a union with the Bristol & Gloucester, and the purchase by the united company of the Cheltenham & Great Western Union Railway. A Bill to authorise this union and purchase was actually introduced into Parliament, but the negotiations eventually fell through, and the Bill was abandoned.

A year later, when the works had been commenced, the Directors stated that they saw no reason whatever for altering their decision to adopt the Narrow Gauge, which had been unanimously confirmed by the Shareholders at the last General Meeting. In 1842, by arrangement with the Cheltenham & Great Western, the Bristol & Gloucester got Parliamentary powers to make the line between Standish Junction and Gloucester themselves and lay narrow-gauge rails thereon, subject to power of repurchase by the former Company.

Hence, up to the end of 1842, there was no intention on the part of the Bristol & Gloucester Directors of making their railway on a different gauge from the Birmingham & Gloucester, which had now been open more than two

years. Early in the next year, however, they changed round completely. The acquisition of the Cheltenham & Great Western Union by the Great Western was imminent, and this seems to have thoroughly frightened them and made them feel that the friendship of that powerful Company must be secured at any cost. No doubt they were also urged on by their Engineer, who was no other than Brunel himself. The only member of the Board who was also a Director of the Great Western, George Jones, the Chairman, is said to have been opposed to the change.

Whatever the undisclosed motives, if any, may have been, the Bristol & Gloucester Board came to an agreement with the Great Western in April 1843 to adopt the Broad Gauge, and make a branch in Bristol to join the Great Western near the bridge over Marsh Lane. The Great Western on their part undertook to complete a double line between the junction at Standish and Gloucester by April 1844, and to give the Bristol & Gloucester the use not only of that but also of the line between Gloucester and Cheltenham, and between the proposed junction at Marsh Lane and their Bristol Terminus, as well as of their passenger and goods stations at Bristol, Gloucester, and Cheltenham, with all requisite accommodation, including suitable sidings at Gloucester for the exchange of goods with the Birmingham & Gloucester Railway. The agreement was to last for twenty years from the day the Great Western began to work the Cheltenham & Great Western Union, and the Bristol & Gloucester Company were to pay by way of yearly rent £11,000 for the line between Standish and Gloucester, £4,000 for the line between Gloucester and Cheltenham, and £3,500 for the three stations; in all

£18,500, to be increased by £1,000 after the first five years.

In a lengthy report to the Special Meeting of the Bristol & Gloucester Shareholders called to consider this agreement, the Directors, after emphasising their fears of possible Great Western hostilities at both ends of the line, pointed out the advantages of avoiding a large outlay of capital on making the Standish-Gloucester line and providing a terminal station at Bristol, as to which no steps had yet been taken, and of a connection there with the Bristol & Exeter as well as the Great Western. They anticipated no trouble from the break of gauge with the Birmingham & Gloucester, as their Engineer had persuaded them that "a very simple arrangement may effect the transfer of the entire load of goods from the waggon of one Company to that of the other," while the passengers will "merely step from one carriage into the other in the same station and on the same platform."

At the meeting the confirmation of the agreement was opposed by C. B. Fripp, who was a Director of the Bristol & Exeter, and had been one of the Great Western itself. He had few followers however, and the agreement was confirmed by a considerable majority.

Thus the Bristol & Gloucester became a broad-gauge railway,¹ and soon cemented its alliance with the Great Western and Bristol & Exeter by agreeing to subscribe £50,000 to the proposed line from Exeter to Plymouth, afterwards known as the South Devon Railway.

¹ Owing to the works being already far advanced, the railway was never of the full broad-gauge width; for instance, the Wickwar and Fishponds Tunnels were only 26 feet wide, and the under-bridges the same between their parapets (Gauge Commission Evidence).

Negotiations for a working agreement with the Great Western having failed on the question of terms, the Bristol & Gloucester Directors contracted with Stothert, Slaughter & Co., of Bristol, to provide the entire plant and work the line for ten years from its opening.

This took place for passengers on the 8th July 1844, from Temple Meads Station at Bristol to a temporary station at Gloucester made by adding a platform to the north side of the Birmingham & Gloucester Terminus, the Great Western having as yet no station there.

Goods traffic commenced on the 2nd September, and at once the inconvenience of the break of gauge made itself felt. The bulk of the goods was through traffic to and from the Birmingham line, and of course all this had to be transferred from waggon to waggon at Gloucester. Brunel's "very simple arrangement" for transferring entire loads was not forthcoming, or was found impracticable; at any rate, it was not used, and the congestion in the small and utterly insufficient transfer shed provided became worse and worse as the traffic increased.

The consequent delay and loss of packages by mis-sorting soon became notorious, and was much exaggerated by the Narrow Gauge faction as an argument for enforced uniformity of gauge. The Broad Gauge party, on the other hand, alleged that the trouble was due to insufficient accommodation and more or less intentional mismanagement.

G. P. Neele of the London & North Western in his *Railway Reminiscences*¹ relates that J. D. Payne, then Goods Manager of the Birmingham & Gloucester Railway, used to boast of having taken a leading part in checking the extension of the Broad Gauge. Hearing

¹ McCorquodale and Co., Ltd., 1904.

that the members of a Parliamentary Committee were coming to Gloucester to see for themselves the evil of which they had heard so much, Payne hurried down to prepare for them. "Fearing lest the extent of the transfer work might be too small to impress the Committee, he arranged for the unloading of two trains already dealt with, as an addition to the usual work, and when the Members came to the scene, they were appalled by the clamour arising from the well arranged confusion of shouting out addresses of consignments, the chucking of packages across from truck to truck, the enquiries for missing articles, the loading, unloading and reloading, which his clever device [*sic*] had brought into operation."

Towards the close of 1844 negotiations for amalgamation with the Birmingham & Gloucester Company were renewed, and this time brought to a successful issue. An agreement was signed by the respective Chairmen on the 14th January 1845, and ratified by the shareholders a fortnight later; and a Bill to effect the union and constitute the Bristol & Birmingham Railway Company carried into Parliament.

Immediately after the terms of union had been agreed on, the Directors were invited by the Great Western Board to negotiate on the subject of extending the Broad Gauge from Gloucester to Birmingham. Their consultations resulted in a proposal to amalgamate with the Great Western. At a meeting held at Bristol on the 24th January the Great Western Deputation offered £60 of their capital, then worth at the price of the day £123, for each £100 of Birmingham & Gloucester worth £109. The representatives of the two Companies stood out for £65 Great Western capital, and the meeting was adjourned to the 27th, in London, when Saunders gave

the final answer of his Board that they would not increase their offer.

The next day the line was snapped up by the Midland Company!

How this dramatic event occurred is told us by the chief actor himself, John Ellis, the Deputy Chairman of that Company, in his evidence before the Committee of the House of Commons on the Oxford & Rugby Railway Bill. On the 26th January Ellis happened quite by chance to travel to London in the company of Edmund Sturges and Joseph Gibbons, Directors of the Birmingham & Gloucester Railway, who casually mentioned the negotiations going on with the Great Western, and told him that the matter was to be settled the very next morning. Having already had personal experience, in his business as a worsted spinner at Leicester getting wool from Bristol, of the delays caused by the break of gauge at Gloucester, he began, as he puts it, "to look about my interest in the railway and to think the Broad Gauge would come too near." Evidently a man of quick decision, he went at once to the Bristol & Birmingham negotiators and obtained a promise that if they did not settle with Saunders they would bargain with him. They came to him, and this bold and far-seeing Quaker, entirely on his own responsibility, pledged his Company to take a perpetual lease of the Bristol & Birmingham line from the 1st July 1845 at a rent of 6 per cent. on the united capital of £1,800,000, and to undertake all outstanding liabilities, estimated at nearly half a million.

"I took great responsibility on myself when I leased that line; I had not an opportunity of consulting with my colleagues, and I took a bold step to secure the interests of the Company I represented; I am satisfied I did right,

and I am glad to say I had the concurrence of the whole of my colleagues in what I did. I had heard so much of the inconvenience of loss of packages and annoyance to the trade altogether, that when this thing was offered to me I considered I had better run the risk of losing a few thousand pounds than admit the plague of the Broad Gauge to Birmingham. It was from no feeling against the Great Western, but it seemed to me, somehow or other, that they have drawn the line themselves of demarcation between the two gauges; that Oxford and Bristol are the places where they ought to change."

Having settled the business, Ellis at once went to the Board of Trade to inform them of the fact. At the door of the room he met Saunders! "I spoke to him but did not tell him what I had done." However, he made no secret of it, but let it be known in London the same day.

A meeting of the Midland Board was called to sanction the agreement. It was sanctioned unanimously and signed by the Chairman, the notorious "Railway King," George Hudson; having already been signed by Samuel Bowly and George Jones, the respective Chairmen of the Birmingham & Gloucester and Bristol & Gloucester Companies. The date of this Agreement was the 8th February 1845, less than a fortnight after Ellis's eventful journey with Sturges and Gibbons. It expressly states that it is made "under the conviction of the absolute necessity of a uniformity of gauge between the northern and manufacturing districts and the Port of Bristol." In the following month special meetings of the three Companies confirmed the arrangement, which was ratified by Parliament in 1846.

Thus the first battle of the gauges was won by John Ellis for the Narrow Gauge, and the Great Western lost

the Bristol & Birmingham for a paltry difference of £5 a share. Poor Saunders and his Directors must have felt extremely sore over this sudden defeat, but they had no right to complain of Ellis's perfectly fair and straightforward action. It has been asserted¹ that the Bristol & Birmingham Directors carried on negotiations with both the Great Western and Midland simultaneously; the evidence, however, shows this was not so.

The only real ground of complaint the Great Western had was that making the Bristol & Gloucester a narrow-gauge line would be a breach of the Agreement of April 1843, their part of which they had duly carried out. On the strength of this, they succeeded in securing the insertion of a clause in the Midland Amalgamation Act of 1846, requiring that Company to maintain on the Bristol & Gloucester Railway, between the junctions at Bristol and Standish, "two lines of railway of the same gauge as the Great Western Railway," and giving the latter running powers over them. It was not till two years later that the Midland obtained an Act authorising them to add narrow-gauge rails between the Bristol (G.W.) Terminus and Standish, and to make a separate narrow-gauge line thence into Gloucester. This Act gave the Great Western, in addition to their former powers, "all proper and convenient accommodations in respect of stations, sidings, waiting and watering places, and other facilities."

Until June 1854, when the Narrow Gauge was opened throughout between Bristol and Gloucester, the Midland Company continued to work the line on the Broad Gauge—they had taken over the working from Stothert,

¹ By the late C. E. Stretton in his *History of the Midland Railway*. Methuen, 1901.

Slaughter & Co. and purchased their stock in July 1845—and to run over the Great Western between Standish Junction and Gloucester Station. They then got rid of the broad-gauge stock, selling some of the carriages to the Bristol & Exeter, but owing to the 1846 Act were unable to remove the broad-gauge rails. Though never used by the Great Western, these were maintained till 1872, when their use became impossible by the conversion of all that Company's lines in the Gloucester District. Between Bristol and Westerleigh they remained for another ten years after this, to accommodate a Bristol & Exeter coal train which, under an agreement with the Midland, ran daily to and from Parkfield Colliery.

Before leaving the story of the Bristol & Gloucester Railway, there is one item of interest worth notice. The right of the Avon & Gloucestershire Railway to use the line between Mangotsfield and Coal Pit Heath had been preserved by the Bristol & Gloucester Act of 1839. To provide for this, rails of the gauge of 4 feet 8 inches were added inside the Broad Gauge from the junction at Mangotsfield to that at Westerleigh, a distance of about $2\frac{1}{2}$ miles, and this section therefore became the first example of a mixed-gauge railway in the country. The old fish-bellied rails, which had been taken up, were used for the purpose, laid on cross sleepers instead of the former stone blocks between the longitudinal timbers carrying the broad-gauge rails, and to avoid the need of interfering with the latter at the crossings these inner rails were kept two inches above their level so that the only gaps necessary were in the narrow-gauge rails. The use of these for the horse-drawn traffic of the Avon Railway was actually sanctioned by Major-General Pasley, who reported to the Board of Trade that the safety of the

public would be amply provided for by a rule that the horses should always start immediately after the passage of a passenger train, and that these should only run at intervals of not less than an hour and a half! This bright idea was, however, not acted on, and six months later we find the Canal Company complaining to the Board that their traffic was still prevented from using the line. The General then withdrew his suggestion, and said that the only safe way of providing for the Avon Railway's horse traffic was by laying an independent single line for it alongside the main line, but that the expense of this to the Bristol & Gloucester Company would be more than the traffic was worth, it being acknowledged to have averaged only 204 tons in 46 waggons a week during 1843. He therefore suggested that the two Companies should come to some agreement on the subject.

3. OXFORD & RUGBY, AND OXFORD, WORCESTER & WOLVERHAMPTON RAILWAYS

Owing to the depression in trade and tightness of money since 1836, the country between the Great Western and London & Birmingham main lines remained for some years without railways. Schemes had been projected in that year for lines from Rugby through Oxford to Basingstoke, called The North & South Junction Railway, and between Wolverhampton and Worcester with the high-sounding title of The Grand Connection Railway, both quite independent of the Great Western, and also, as we have seen, for a line from Oxford to Worcester with a probable continuation to Porth Dynlleyn.

The Oxford & Rugby project was taken up by the

Great Western Directors in the spring of 1844, the importance of such a north and south communication having been brought out in the course of the Parliamentary proceedings on the two rival Newbury schemes,¹ when it became evident that if the Great Western did not provide it, some other company would. Rugby was at this period the gate to the whole of the north, the Midland Counties Railway from Derby joining the London & Birmingham there and forming the only route from Derbyshire, Yorkshire, and places beyond to London and the south. At the August Half-yearly Meeting they reported to the Shareholders:

The necessity of the Oxford and Rugby line is universally admitted. It will form a direct communication from the North by the Great Western Junction at Basingstoke with Hampshire and the South Coast. The University Authorities have given their consent to it, and at meetings held in Oxford and Banbury unanimous Resolutions have been passed in favour of the Great Western Line being so continued towards the North. The principal Land owners have been seen and there is every reason to rely upon general support from them. The Line cannot fail greatly to enhance the value of the Junction Line to Basingstoke, both to the Public and to the Shareholders.

Accordingly the Meeting authorised them to take all necessary steps for applying to Parliament for an Act for making the line.

In this same spring of 1844 the Board was approached by representatives of the mining and manufacturing district of South Staffordshire, and parties connected with the earlier Worcester project, asking for their assistance towards a line, of course broad-gauge, from Oxford through Worcester to Wolverhampton. Before promising support the Great Western Directors required

¹ See page 277.

evidence that the local interests generally were in favour of the line, and it was suggested with a view to lessen the mileage and expense that the projected railway, instead of joining the Great Western at Oxford, should join the Oxford & Rugby line north of Banbury. These terms being assented to, a conditional agreement was made in August for a lease of the line when completed to the Great Western Company. In the course of the next month, however, it was decided to carry the line direct from Oxford to Worcester, as originally proposed, and a new agreement was accordingly made on the 20th September between the Great Western Directors and three representative members of the Committee of the Oxford, Worcester & Wolverhampton, whereby the capital was increased from a million to a million and a half, the amount of Brunel's somewhat sanguine estimate of the total cost of the line, and the Great Western were to take a long lease of the railway, when completed as a broad-gauge double line, at a rent of $3\frac{1}{2}$ per cent. on such capital and half surplus profits. This agreement was subject to four conditions: Satisfactory proof of a yearly traffic of £131,250, that two-thirds of the landowners were consenting or neutral, the Board of Trade's approval of the Bill, and a *bona fide* subscription list of £900,000. In the event, none of these conditions save the first were fulfilled, yet the Great Western continued their support and, in fact, became principals in the Parliamentary fight which ensued. Moreover, although it was no part of the arrangement with the promoters, on the latter finding themselves at the last moment unable to make up a sufficient subscription list, the Great Western Company arranged to take up no less than 7,500 shares, equivalent to £375,000 capital.

Though neither of the proposed railways would compete with them, directly at any rate, the London & Birmingham Company, who were in close alliance with the Midland, at once took steps to repel what they considered an invasion of their country. Under the title of the London, Worcester & South Staffordshire Railway, they promoted a line from Tring through Aylesbury, Bicester, Banbury, Fenny Compton, Kineton, Evesham, Worcester, Stourport, and Dudley to Wolverhampton, with branches from Bicester to Oxford, and from near Fenny Compton to Rugby; these branches of course forming a competing Oxford & Rugby line. They also projected an extension from Oxford to Didcot, parallel with the existing broad gauge line, to join the South Western's Basingstoke & Didcot Junction Railway, but on the abandonment of the latter the Oxford & Didcot Bill was withdrawn.

Here then were the makings of a very pretty fight for the Parliamentary Session of 1845, which came to be the second Battle of the Gauges.

Proceedings opened before the Board of Trade in the autumn. Anticipating an overwhelming rush of railway Bills, Parliament had ordered the Board to institute inquiries into the merits of competing projects and make reports to the ensuing session. These inquiries were conducted by Lord Dalhousie, who had succeeded Mr. Gladstone as President of the Board, General Pasley, Inspector-General of Railways, Captain O'Brien, and Messrs. G. R. Porter and S. Laing, afterwards Chairman of the Brighton Railway. In railway circles these gentlemen became known as the "Five Kings."

Their Report on the Rugby and Wolverhampton schemes came out in January 1845, and proved to be

dead against the northward extension of the Broad Gauge, and in favour of the district being given to the London & Birmingham Company.

The undeniable evil of a break of gauge, already experienced at Gloucester, is dwelt on, and Brunel's suggestion for obviating it by contrivances for transferring the bodies of goods waggons from one set of wheels to another declared to be impracticable, even if the mechanical difficulties were overcome, by reason of the large additional stock that would have to be kept to provide for journeys involving the transfer. As to the proposal of mixing the gauge, they say :

The second arrangement, of laying down additional rails, may be practicable under peculiar circumstances, and to a limited extent, but it is open to great objections.

It is very doubtful how far the addition of a single rail only would be consistent with safety, as in this case the centre of gravity of the carriages of different gauges in the same train would not be in the same straight line. If a complete double set of rails were laid down the expense would be very considerable. The complication of switches and crossings that would be necessary would involve considerable additional risk and great expense. The difficulty and expense of maintaining the permanent way and of keeping the double set of rails in proper adjustment would be greatly increased ; and on the whole the expense, inconvenience and risk would probably be so great as to prevent the experiment being tried to any extent.

We cannot therefore consider the plan of laying down additional rails as applicable, unless perhaps to a limited extent and under special circumstances, such as enabling, for instance, mineral waggons constructed for the narrow gauge to pass for a short distance and at a slow speed over a wide gauge railway ; with which view alone it is proposed to lay down extra rails upon the Oxford, Worcester, and Wolverhampton line, for a few miles south of Wolverhampton.

On the whole, therefore, we cannot consider the mechanical arrangements which have been proposed for obviating the inconvenience of a meeting of different gauges (even if we could assume their practicability, which in the present state of experience we should not be warranted in doing), as anything better than partial and imperfect palliatives of a great evil.

This is sound enough, save in one respect. It does not seem to have occurred to the "Five Kings" that their objection to the single additional rail was founded on the fallacy that vehicles of both gauges would run in the same train. They go on:

Assuming this to be the case, and assuming also, as we are compelled to do, that an interruption of gauge must exist somewhere, the question is reduced to this: to ascertain at what points such interruption should be fixed in order to occasion the least inconvenience to the traffic and commerce of the country. From the fact that nearly 2,000 miles of railway are already made or sanctioned on the narrow gauge, while not more than 300 are sanctioned on the wide gauge, a disproportion which will be still more largely increased by the new railways now in contemplation, an inference might be drawn in favour of confining the gauge which is in such a decided minority within the narrowest possible limits; and this inference might be strengthened by referring to the obvious fact that the wide gauge has not realized those decided advantages over the narrow gauge which were at one time anticipated.

The actual speed of trains upon the Great Western Railway, as shown by the published time-tables and by official returns, is not so high as upon some narrow gauge Railways, and, notwithstanding the excellence of its gradients, very slightly higher than the average speed of other great Railways on the narrow gauge. In respect of safety, it is manifest that both gauges are alike unobjectionable, with due precaution and proper management; and in respect of convenience and of economy, including the cost both of construction and working, the opinion of a great majority of the most eminent authorities is unfavourable to the wide gauge.

Without wishing to express any positive opinion ourselves upon the point, it is enough for us to say that we think there is nothing in the relative merits of the two gauges in themselves materially to affect the question between them, which turns upon commercial considerations.

That this statement as to the speed on the Great Western Railway at this time was a disgraceful truth was quickly realised at Paddington; so in March the original Exeter Express was put on to do the 194 miles in five hours—reduced to four and a half early in May when the

battle had just begun in the Commons Committee—a speed far in advance of anything attempted on narrow-gauge lines for many years.

The Report proceeds to discuss the traffic passing and likely to pass over the proposed lines and the Bristol & Birmingham Railway, and recommends that the unavoidable breaks of gauge should be made at Oxford and Bristol, as the places where there would be the least through traffic, rather than at Rugby, Wolverhampton, Birmingham, or Gloucester.

Anticipating the objection that giving the district to the London & Birmingham would create a great monopoly, and stifle competition, the “Kings” allege that “to allow the Great Western Company to embrace by their influence not only the whole western communications of the island, but also the whole of South Wales, and the whole district up to Worcester and Birmingham, would be to establish a monopoly much more gigantic than that of the London & Birmingham.” The latter Company, they add, has voluntarily offered, on condition of their Worcester scheme being sanctioned, that the Act should provide for reducing the maximum rates for passengers and goods over the whole of their system, and to pledge their whole revenue for the completion of the proposed lines within a reasonable time. The competing scheme is expressly stated to have offered no such guarantees against any possible abuses of monopoly. As a matter of fact, the Great Western was never invited to do so, or afforded any opportunity of meeting the case set up by the other side. Saunders complained of this before the Commons Committee, but attributed it to the great pressure of business on the Board of Trade and not to any intentional unfairness.

In this preliminary skirmish before the "Five Kings," the Broad Gauge party was thus thoroughly worsted by the enemy. Nothing daunted, they proceeded with the condemned projects, and in due course the Bills for the Oxford & Rugby and Oxford, Worcester & Wolverhampton broad-gauge Railways came before Parliament, and having safely passed the preliminary stages in the House of Commons, were referred to the same Committee, together with the rival narrow-gauge projects in the district.

The Committee opened their proceedings on the 5th May, and on nineteen days between this and the 4th June heard 102 witnesses answer 12,148 questions. Most of the witnesses were iron masters, colliery proprietors, and other commercial men of the Worcestershire and South Staffordshire districts. Engineers were represented by Robert Stephenson and R. B. Dockray of the London & Birmingham, Nicholas Wood, John Hawkshaw of the Manchester & Leeds, William Cubitt late of the South Eastern, J. Baylis of the Birmingham & Gloucester, and of course Brunel; Managers by W. Harding of the Bristol & Gloucester, J. D. Payne of the Birmingham & Gloucester, Captain Lawes of the Manchester & Leeds, Peter Clarke late of the North Midland, William Hansom of the Eastern Counties, Captain Mark Huish of the Grand Junction, and C. A. Saunders; and Locomotive Engineers by J. McConnell of the Birmingham & Gloucester, E. Bury of the London & Birmingham, and Daniel Gooch. George Hudson, the "Railway King," Chairman of the Midland and other north country lines, John Ellis, Deputy Chairman of the Midland, and Charles Russell also gave their views.

It is quite impossible to attempt even to summarise the

evidence, most of it of little interest nowadays; it was published by the Government, and can be read in a Blue Book of some 700 pages. Suffice it to say that on the 4th June the Committee announced their decision that the preambles of the Oxford & Rugby and Oxford, Worcester & Wolverhampton Bills had been proved, and that of the London, Worcester & South Staffordshire had not.

This was, of course, a great victory for the Broad Gauge, but it was tempered by a clause obliging the Great Western to add the Narrow Gauge throughout the Oxford & Rugby line, if called upon to do so by the Board of Trade. The addition of Narrow Gauge on the Oxford, Worcester & Wolverhampton Railway between the junctions with the Birmingham & Gloucester line at Abbot's Wood near Worcester and the Grand Junction line at Wolverhampton and on the branch to Stoke Prior had been provided for in the original agreement between the promoters and the Great Western, and was included in the Bill as deposited.

The London & Birmingham authorities took this defeat very hardly, and at once proceeded, with the aid of the Midland, to beat up opposition to the adoption of the Committee's Report by the House of Commons. Upon this the Grand Junction Company came to the aid of the Great Western by issuing the following interesting circular to their shareholders:

GRAND JUNCTION RAILWAY

The Directors beg to draw your attention to the decision, which after a long investigation, the Committee of the House of Commons has pronounced in the case of the Lines for connecting Oxford with Rugby on the one hand, and with Worcester and Wolverhampton on the other.

The decision, as you are probably aware, has been in favour of the Lines promoted by the Great Western Company, for which the Grand Junction have petitioned.

The Directors have been informed, through the medium of a circular from the London and Birmingham Company that an active canvas has commenced for the purpose of setting aside the decision; they consider it their duty therefore to urge you to meet this attempt by inducing such members of Parliament as you know to attend on the 17th inst., on the bringing up of the Report.

The question at issue has been represented as one entirely of Broad and Narrow Gauge; upon this point the Directors may observe that they do not anticipate any inconvenience whatever to arise from the introduction of the Broad Gauge among the Narrow Gauge Lines, or the mixture of gauges on the same Line. On the contrary, looking at Express Trains running at high speed, which are now being introduced on the leading roads, they deem it probable that many Companies possessing Trunk Lines on the Narrow Gauge principle may find it their interest to adopt both; and the Directors have ascertained the perfect practicability of adding the Broad Gauge on the Grand Junction at a very reasonable cost.

They consider, therefore, that any exclusive system south of Birmingham, which would deprive them of the power hereafter of adopting the Broad Gauge in addition to the Narrow would be a great evil to the public; but the question appears to them one of a much more comprehensive character—namely, whether the entire district between London, Bristol, and Birmingham shall be handed over to the absolute monopoly of the London and Birmingham Company, who, already, by purchase, lease, amalgamation, and arrangements with various Railways and Canals, are seeking to obtain, in addition to their Line from London to Birmingham, the entire control from Birmingham to Manchester, and Birmingham to Holyhead.

Such extensive powers would be in the highest degree dangerous to the public, and inconsistent with the fair interests of the Grand Junction Company.

It is on this ground, therefore, apart from the question of gauge, and convinced that from fair and open competition throughout between London, Liverpool and Manchester the Proprietors of the Grand Junction have nothing to apprehend; and feeling satisfied that no legislative enactments proposed by the London and Birmingham to be introduced into their Bill, will enable the Grand Junction so successfully to compete with that Company's extended schemes, as the formation of another Line, independent of the London and Birmingham Company, that the

Grand Junction Directors, after exhausting every means in their power to avoid the present position of affairs, have resolved to solicit your aid with Members of Parliament in support of the Oxford and Rugby and the Oxford, Worcester, and Wolverhampton projects.

By order of the Board,

MARK HUISH, *Secretary*.

Liverpool. 11th June 1845.

Whether the Grand Junction really intended to lay the Broad Gauge on their line from Birmingham to Liverpool and Manchester may, perhaps, be doubted. The threat may have been merely an astute move on the part of Captain Huish in his war with the London & Birmingham. Anyhow, it soon brought that Company to its knees, and the birth of the London & North Western Railway, by the amalgamation of the London & Birmingham, Grand Junction, and Manchester & Birmingham Companies, was the result. We have Captain Huish's own words to a Parliamentary Committee in 1853: "The effect of the circular was undoubtedly to bring about an immediate arrangement between the London and Birmingham and the Grand Junction, and to obtain for the Grand Junction a large sum of money as the price of it." Probably this was its main intention!

The Committee's Report on the Oxford, Worcester & Wolverhampton Railway came before the House on the 20th June, and was debated at some length. The opposition was led by Richard Cobden, of Free Trade fame, who proposed an amendment asking for a Royal Commission to enquire whether uniformity of gauge ought not to be insisted on in all future railway Acts, and as to the practicability of altering existing lines. This was negatived, and the Bill passed by 247 votes to 113, a

majority of more than two to one. The Oxford & Rugby Bill was then passed by 79 to 43, and both Bills were read a third time on the 24th June and sent up to the Lords. The Lords' Committee, after a renewed investigation and protracted opposition, reported unanimously in favour of them, and they finally received the Royal Assent on the 4th August 1845.

4. THE GAUGE COMMISSION

Having failed in his efforts to defeat the Oxford & Rugby and Oxford, Worcester & Wolverhampton Bills, Mr. Cobden moved the following resolution in the House of Commons on the 25th June 1845:

That it having been represented to this House by Petitions from various public bodies, as well as from Merchants, Manufacturers and others, that serious impediments to the internal traffic of the country are likely to arise from the "breaks" that will occur in Railway communications from the want of an uniform Gauge, and these representations not having been fully inquired into by any of the Committees of this House upon private Bills, and it being desirable that the subject should be further investigated, an humble address be presented to Her Majesty, praying Her Majesty to be graciously pleased to issue a Commission to inquire whether in future private Acts for the construction of Railways, provision ought to be made for securing an uniform Gauge, and whether it would be expedient and practicable to take measures to bring the Railways already constructed or in progress of construction in Great Britain into uniformity of Gauge, and to inquire whether any other mode of obviating or mitigating the apprehended evil could be adopted, and to report the same to this House.

This was adopted without opposition, and a Royal Commission was accordingly issued on the 9th July to "Our trusty and well-beloved Sir John Mark Frederic Smith, Knight, Lieutenant-Colonel in Our Corps of Royal Engineers, late Inspector-General of Railways; George Biddell Airy, Esquire, Astronomical Observator in Our

Observatory at Greenwich; and Peter Barlow, Esquire, Professor of Mathematics in Our Military Academy at Woolwich," directing them to conduct the inquiry prayed for.

The Commissioners began taking evidence on the 6th August, and after eleven days of it adjourned on 4th September for a six weeks' holiday till the 17th October, when the Great Western champions made their first appearance. They were Daniel Gooch, Locomotive Superintendent, Seymour Clarke, Traffic Superintendent of the London Division, at this time extending to Oxford and Gloucester, Charles Saunders, Secretary and Manager, and Brunel. The sittings concluded on the 18th December, having occupied thirty days. Forty-eight witnesses were examined, of whom fourteen were engineers, eight engine builders or locomotive superintendents, sixteen directors, managers, or traffic superintendents, and ten non-railwaymen, including the Inspector-General of Fortifications, the Quartermaster-General, and the Inspector-General of Railways. Though many of them considered the accidentally fixed 4 feet 8½ inches somewhat too narrow, the four Great Western officers were alone in supporting the extreme width of seven feet, and in attempting to make little of the undeniable evil of breaks of gauge, which was emphasised and even exaggerated by the other witnesses.¹

Towards the close of the evidence Brunel suggested experiments to test the power of the broad- and narrow-gauge engines with trains of similar weights and speeds. As no engine had been built for the Great Western since 1842, while the narrow-gauge engines had been much

¹ The Minutes of Evidence and an Appendix of Documents and Statistics were published in two large Blue Books.

improved in the interval, this was a distinctly sporting offer. It was accepted somewhat unwillingly by the other party on condition that the broad-gauge experiments should be conducted first, and not both simultaneously, as Brunel suggested. Long distance tests were also declined by the Narrow Gauge representatives, who proposed Paddington and Didcot, 53 miles, and York and Darlington, 44 miles, as the rival courses, which had to be accepted.

Gooch chose *Ixion*, one of the 72 seven-foot single six-wheeled engines then in daily use, as the broad-gauge champion. This engine had been built by Fenton, Murray & Jackson in October 1841, and had $15\frac{3}{4}$ inch cylinders with an 18 inch stroke. Three trips to and from Didcot with loads of 80, 70, and 60 tons respectively were made on the 16th and 17th December. The narrow-gauge competitor was known as *Engine A*, a curious six-wheeled affair just built by Stephenson and Co., with 6 feet 6 inch single driving wheels and outside cylinders 15 by 21 inches. With hot water in the tender and a flying start this engine took a load of 50 tons from York to Darlington and back in the morning and 80 tons to Darlington only in the afternoon of the 31st December, an attempt on the previous day having been abandoned owing to bad weather. The trial of a North Midland engine No. 54, named *Stephenson*, on the following day terminated in its running off the line and falling over after covering twenty-two miles. Careful records of the speed and boiler pressure at each mile, and the coke and water consumed on the journeys were taken in each case by the Commissioners and both parties.¹ The general

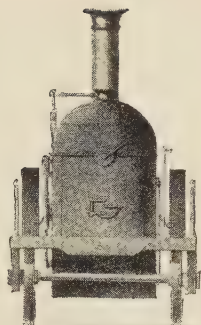
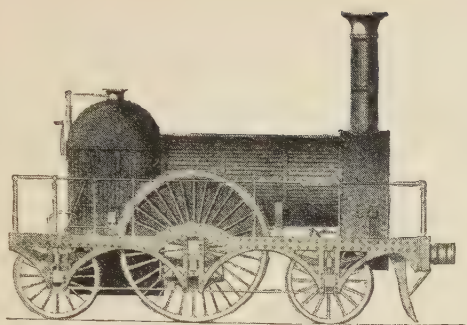
¹ They were published in the Appendix to the Commissioners' Report.

result was much in favour of *Ixion*, both for power and speed, though no exactly comparable tests were made. Further trials of two six-coupled goods engines, each named *Hercules*, were made on the 2nd and 10th January.

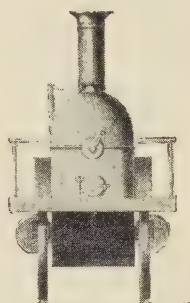
The Commissioners state in their Report that the experiments proved "that the Broad Gauge Engines possess greater capabilities for speed with equal loads, and, generally speaking, of propelling greater loads with equal speed; and, moreover, that the working with such engines is economical where very high speeds are required, or where the loads to be conveyed are such as to require the full power of the engine."

On the subject of speed and express trains, they say incidentally: "We feel it a duty to observe here that the public are mainly indebted for the present rate of speed and the increased accommodation of the railway carriages to the genius of Mr. Brunel and the liberality of the Great Western Railway Company."

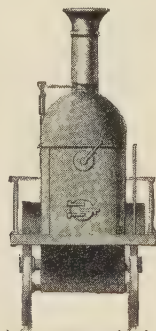
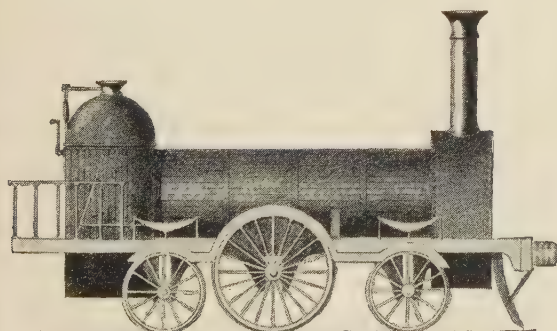
The Report, however, was generally dead against the Broad Gauge. It was laid before Parliament at the beginning of the 1846 Session. After discussing the subject in all its aspects, the Commissioners sum up their conclusions as to the need for uniformity of gauge by saying that "they consider a break of gauge to be a very serious evil," that "no method has been proposed to them which is calculated to remedy in any important degree the inconvenience attending a break of gauge"; and, with reference to the expedient of mixing the gauges on the same line, that "the general adoption of such a system ought not to be permitted." Apart from this last, the methods proposed had been (1) wheels sliding on their axles adjustable to either gauge; (2) broad-gauge



BROAD-GAUGE ENGINE "IXION"



NARROW-GAUGE ENGINE "A"



NARROW-GAUGE ENGINE NO. 54

GAUGE TRIAL ENGINES

“crocodile” trucks to carry narrow-gauge vehicles; (3) bodies movable from one set of wheels to the other; and (4) containers, of which a broad-gauge truck would carry two, a narrow-gauge one only. All these were condemned as impracticable in everyday working.

The Commissioners then examine the comparative advantages of the two gauges, and state that :

After a full consideration of all the circumstances that have come before us and of the deductions we have made from the evidence, we are led to conclude—

1st. That as regards the Safety, Accommodation, and Convenience of the Passengers, no decided preference is due to either Gauge, but that on the Broad Gauge the motion is generally more easy at high velocities.

2nd. That in respect of Speed, we consider the advantages are with the Broad Gauge; but we think the public safety would be endangered in employing the greater capabilities of the Broad Gauge much beyond their present use, except on roads more consolidated and more substantially and perfectly formed than those of the existing lines.

3rd. That in the commercial case of the Transport of Goods we believe the Narrow Gauge to possess the greater convenience, and to be the more suited to the general traffic of the Country.

4th. That the Broad Gauge involves the greater outlay; and that we have not been able to discover, either in the maintenance of way, in the cost of locomotive power, or in any other annual expenses, any adequate reduction to compensate for the additional first cost.

Therefore esteeming the importance of the highest speed on Express Trains for the accommodation of a comparatively small number of persons, however desirable that may be to them, as of far less moment than affording increased convenience to the general commercial traffic of the Country, we are inclined to consider the Narrow Gauge as that which should be preferred for general convenience; and therefore, if it were imperative to produce uniformity, we should recommend that uniformity to be produced by an alteration of the Broad to the Narrow Gauge, more especially when we take into consideration that the extent of the former at present in work is only 274 miles, while that of the latter is not less than 1901 miles, and that the alteration of the former to the latter, even if of equal length, would be the less costly as well as the less difficult operation.

The Report concludes with the following recommendations.

1st. That the Gauge of 4 feet 8½ inches be declared by the Legislature to be the Gauge to be used in all public Railways now under construction or hereafter to be constructed in Great Britain.

2nd. That, unless by consent of the Legislature, it should not be permitted to the Directors of any Railway Company to alter the Gauge of such Railway.

3rd. That, in order to complete the general chain of Narrow Gauge communication from the North of England to the Southern Coast, any suitable measure should be promoted to form a Narrow Gauge link from Oxford to Reading, and thence to Basingstoke, or by any other route connecting the proposed Oxford and Rugby Line with the South Western Railway.

4th. That, as any junction to be formed with a Broad Gauge Line would involve a break of gauge, provided our first recommendation be adopted, great commercial convenience would be obtained by reducing the gauge of the present Broad Gauge Lines to the Narrow Gauge of 4 feet 8½ inches; and we therefore think it desirable that some equitable means should be found of producing such entire uniformity of gauge, or of adopting such other course as would admit of the Narrow Gauge carriages passing, without interruption or danger, along the Broad Gauge Lines.

The Great Western representatives at once set about preparing a reply to this unexpected report, which the Broad Gauge party considered grossly unfair and unwarranted by the evidence. With the help of Brunel and Gooch, Saunders soon produced his able "Observations on the Report of the Gauge Commissioners," a folio publication of some fifty pages.¹ In this, general objection is first made to the acceptance of statements and opinions by interested witnesses, not subject to cross-examination or any other check, as facts.

Such repetition of statements and opinions unsifted could not fail, insensibly perhaps, to produce its effect on the minds of the

¹ Published by James Bigg and Son, Westminster, at 1s.

Commissioners, who may have naturally received them as from impartial parties. A striking proof of this is to be adduced from the fact that, before any of the parties connected with the Broad Gauge had been examined, and at a very early stage of the proceedings, the Commissioners allowed an impression to be produced on their minds by Mr. Locke and Mr. Robert Stephenson, which led to a representation being made by the President of the Commission to the Government that the speed of Express Trains ought to be restricted by law, thereby seriously prejudging one of the most important points at issue between the parties before they had received even one word of evidence to prove the security of the Broad Gauge system of travelling at very high speed. This repression of speed was of course the main line of argument adopted by those who were conscious that they could not compete with the Broad Gauge in their rate of travelling and in safety at high velocities, both of which latter propositions have been since established in favour of the Broad Gauge, and are admitted in the Report itself. Yet this was prejudged. The opinion stated in the Report as that of many of the officers of Railways that "there would be difficulty in maintaining with safety the present Express speed upon the great trunk Railways" must have emanated wholly from the Narrow Gauge advocates as to the capabilities of their own engines and railways. It certainly was never entertained by parties connected with the Broad Gauge. . . . It does not appear, however, that the Government consented to commit themselves to any compliance with such a proposal, and this may be deemed a proof that they do not approve of such limitation on mechanical power.

The Observations then proceed "to consider the Report under the several heads into which it is divided by the Commissioners, from which it will be seen that their calculations and conclusions are not in accordance with the facts, and that very extraordinary mistakes have been introduced into the tables and figures, seriously affecting the character of the Report itself, and the correction of which controverts all their own arguments and reasoning upon them." Numerous real mistakes are then pointed out, and the whole report subjected to searching and detailed criticisms. In conclusion, it is submitted that "the following results are clearly and

fully established." Though of some length, these are worth quoting as giving the official case for the Broad Gauge.

1. That the question of "break of gauge" originated as a cloak to a monopoly, or a means of obtaining and holding a control over an immense traffic by an union of amalgamated companies, without the possibility of competition or interference with such traffic by any other contending system or separate interest.

2. That there has been no evidence given to prove, or any sufficient reason to assume, that even if the gauge were uniform throughout the country, the Passenger Traffic could be carried on by sending the same carriages through, from the trains on the main and principal Railways, to all cross or diverging Lines or Branches, or that the same inconvenience of a change at the principal towns or points of junction would not be experienced, whether it be a Break of Gauge or merely a change of line out of the main thoroughfare.

3. That such is the daily experience and practice now, where the lines converge at one point without any break of gauge, and that the Narrow Gauge Engines have not power to convey greater numbers of carriages to afford the accommodation of sending them through to each separate line of Railway (which is the assumed system), and still to maintain their rate of speed, inasmuch as they are now obliged to limit their quick Trains to First Class Carriages only.

4. That the Transfer of Merchandise, without unloading or disturbing the goods, may be effected by mechanical means, with perfect safety and facility:—that the same waggon with its wheels may be conveyed on a low platform or truck travelling on the Rails, in case it shall have to pass again to the same Gauge in the course of a journey—and that loose bodies or boxes may also be safely employed, as with the Diligences and Waggons in France, to be transferred to other wheels and axles, without delay or difficulty, at any Break of Gauge.¹

5. That even if Goods had to be shifted from one waggon to another side by side, it would simply be a question of cost and

¹ Gooch tells us in his *Diaries*: "I never had any faith in any of these plans as workable in practice." They were never adopted by the Great Western for the transfer in later years of their own traffic at Wolverhampton, Didcot, Swindon, Bristol, or Exeter.

of delay,—that such shifting by hand could be well performed for about sixpence per ton, and with far less delay than is now involved in the ordinary stoppage of Trains arriving at Birmingham, with Goods to be sent forward by other Lines.

6. That the commercial advantage of transporting goods in small waggons is quite as applicable to the Broad as to the Narrow Gauge, and that such waggons are actually running at this time on the Great Western Railway, although the Narrow Gauge may not be able, without considerable overhanging weight, to obtain such large waggons as the Broad Gauge—while proof is given by the Narrow Gauge witnesses that for certain purposes “the larger the Truck the better.”

7. That the advantage of two systems, worked by two independent Companies, would tend greatly to secure the best and most economical management of such business, and to deprive the break of Gauge of its fancied inconveniences, whether to Passengers or to Goods—and that the time would be fully saved of any such interruption by the greater speed attainable on the Broad Gauge, that the fares and charges to the public would inevitably be lowered by the competition, while the accommodation would be improved by the rivalry.

8. That such rivalry and emulation of the two Gauges has already acted most powerfully to the improvement of both, and to the economical as well as rapid transport of Passengers and Merchandise throughout this country, and that it is calculated, if not prohibited, to extend in various ways the same and even still greater public benefits hereafter.

9. That any attempt to restrict improvement by annihilating the Broad Gauge would be in the highest degree impolitic, and would be a subversion of every principle which has hitherto stimulated science and mechanical skill, and would be most unfair and unjust as a punishment to those who have successfully and spiritedly pursued the course of improvement.

10. That the four recommendations of the Commissioners are wholly at variance with their separate conclusions on each branch of their inquiry, inasmuch as they have proved and admitted the superiority of the Broad Gauge, but have advised the adoption uniformly of the Narrow Gauge, if more than a million of money can be found to accomplish the extinction of the Broad and superior Gauge, on equitable conditions.

11. That under the first two recommendations, wherein they have advised the limitation of the Broad Gauge to Lines already made, specifically requiring every Line now making to be constructed on the Narrow Gauge, they would greatly multiply every inconvenience which can be sustained by the public from a Break of Gauge, introducing it at numerous points on direct Metropoli-

tan Lines instead of a few points only on Cross Lines, forgetting also that such recommendations must have the effect of reversing the most solemn decisions of the Legislature during the last and former Sessions of Parliament, which sanctioned certain Lines of Extension as those which could be worked most beneficially for the public, in connexion with the Great Western system and upon which, as Broad Gauge Lines, specifically so enacted, large sums have been already contributed and expended.

12. That the inquiry before the Commissioners has not been conducted in a manner to enable them to obtain accurate and impartial information and sound evidence for their guidance; and that no legislation on the subject can be satisfactorily founded on such loose and erroneous evidence and calculations, without any proper investigation of accounts.

13. That the Commissioners have been misled by Tables which are altogether mis-stated; that their deductions of figures and reasoning upon figures are consequently wrong; that the arithmetical mistakes alone in the tables of speed and time and in the table of cost prove the very converse of all that they assume in respect of the Narrow Gauge capabilities, or their supposed equality of advantage in certain respects with the Broad Gauge.

14. That there is greater economy proved on the Broad Gauge, both in cost of stock (owing to the comparative fewness of Engines and greater capacity of Carriages, etc., for the same work), and that the expenses of Locomotive power are less on the Broad than on the Narrow Gauge.

15. That the greater power of the Engines does not involve waste, even when not required to be used—but on the contrary, the larger size of fire-box and boiler, producing greater power, are productive of economy, even with lighter loads.

16. That the greater power of the Engines, even at ordinary speeds, is essentially conducive to safety—by ensuring greater punctuality of time—and by taking more unlimited loads at all times of the day and seasons of the year, without unnecessarily sub-dividing the trains or using two or more Engines as assistant power excepting in extreme cases.

17. That the power of the Broad Gauge Engines has enabled the Great Western Company, without endangering the public safety by oscillation or by rocking motion (whether it arises from overhanging weight to acquire length or from outside cylinders to gain width of Engine), to attain a much higher speed than the Narrow Gauge Lines, and at such speed to benefit all classes of society without exception, of whom the Second Class travellers, although they cannot afford generally to pay as high fares as the First Class Passengers, probably consider speed as a

commercial saving of time comparatively even more essential to themselves, while the higher classes are content to pay for the sake of this greater comfort and luxury in the better carriages at the same high speed.

18. That the Public will expect and pay for the highest speed by Express Trains; and that they do not partake of the fears or alarm, which have been expressed in the Report, as to the safety of such Trains, notwithstanding the strange representation made by the Commissioners to Government at so early a period of the inquiry, corroborating evidence is furnished by a demand recently made by the Merchants of Liverpool and Manchester for another Express Train to be dispatched at an early hour to London, and which has been granted by the Railway Company and that such Express Trains, if the Broad Gauge existed on those Lines, would convey both classes together at the same speed, and would also perform the journey with a saving in time of one hour at the very least to each passenger between Liverpool and London.

19. That the greater power of the Engines and capacity of the Carriages would enable the Great Western to convey, by means of the same number of Engines and Carriages, 15,000 troops on the Broad, to 10,000 troops on the Narrow Gauge in the case of any emergency for the defence of the Country, and that the transport would be effected in shorter time.

20. That the Broad Gauge, as admitted by the Commissioners, is more smooth as well as more safe at high velocities; and that the greater smoothness and freedom from oscillation and rocking motion mentioned in the Report must reduce the liability to accidents from Engines running off the Line without any known cause of obstruction, as well as from defects in the permanent way, slips in Cuttings, subsidence of Embankments, loss of Gauge, broken or loose Chairs, and fractures of Wheels or Axles, etc., whether acting as the cause or the effect of those contingencies.

21. That no instance has occurred of a Broad Gauge Engine running off the Line, from excessive speed, or without known cause of obstruction, while instances are truly recorded in the Report of accidents from both on the Narrow Gauge Lines.

22. That accidents on the Great Western with their Passenger Trains, whether ordinary or express, have been extremely rare and have never proved fatal to any passenger (the Sonning accident, which occurred to a Luggage Train, alone excepted), their Carriages being constructed on six wheels and made far more solid and substantial in every respect than those on the Narrow Gauge, while from the circumstance of conveying in the extra width more passengers on the same number of wheels, this

additional solidity is gained without carrying as much deadweight for each passenger as on the Narrow Gauge.

23. That easy gradients, however desirable for other objects and principally of course for heavy luggage trains, do not account (as the Commissioners insinuate, by a wrong deduction from the Time Tables) for the higher speed of the Great Western, inasmuch as the lowest speed of their Express Trains is on the most level gradients of their Line, one of the Gauge Commissioners with their Secretary having ascertained personally by experiments that the highest speeds were maintained over the worst gradients between Taunton and Exeter, where the gradients are much steeper than those of either the London and Birmingham or Grand Junction or any of the lines referred to in the Report as running Express Trains; and in these experiments, all mention of which seems to be omitted in the Report, extra weights were added to the Express Trains by additional Carriages, so as to raise it to a load of 70 tons.

24. Finally.—That the Experiments made in the presence of the Commissioners have demonstrated beyond all controversy the complete success of the Broad Gauge System, which aimed at affording the utmost accommodation to the public by carrying large numbers of Passengers of both classes at very high speeds with perfect safety and with comparative comfort and smoothness, taking precautions that by the additional power of the Engines the services should be performed with the greater precision and punctuality at all seasons of the year and in the varying state of the weather without limiting their loads or the public accommodation and without employing two Engines to Passenger Trains, excepting in extreme cases of necessity and never in Express Trains; also providing that the unnecessary multiplication of Goods Trains on main thoroughfares for Passengers should be avoided as much as possible by the capability of taking heavy loads of Goods in a few Trains at a sufficient speed to keep the Line more clear for Passenger Trains, and that the greater power of Engines, while producing economy of expense, should enable the Company to afford better Carriage accommodation and to convey when requisite more Carriages with each Train, to pass over Branch or Extension Lines without change of Carriage on the journey, still maintaining the highest speed of travelling which can be made consistently with safety, as essentially conducive to the comfort and enjoyment of the highest classes as well as tending to the commercial advantages of all individuals by a saving of time accompanied with the most unlimited facilities of locomotion; and the consequence of this greater capability of carrying heavy loads at high speeds must lead much more rapidly to the carrying of large numbers at lower fares.

The Observations were followed, soon after the publication of the Evidence and Appendix of Statistics taken by the Commissioners, by "Additional Observations," criticising these. Both were presented to all Members of Parliament and widely circulated, and doubtless had their effect in the insertion in the Gauge Act of the saving clause, which will be referred to presently.

The Commissioners' Report was referred by the House of Commons to the Board of Trade for their views, and on the 6th June 1846 the latter issued a Minute thereon giving the reasons which prevented them concurring with the full extent of the Commissioners' recommendations.

In this they say:

Adverting to the vast expense which must be involved in an entire alteration of the Broad Gauge, and having regard to the circumstances under which the Companies employing this gauge were established and to the interests they have acquired, my Lords cannot feel themselves justified in recommending that it should be proposed to Parliament to compel the entire reduction of the Seven Feet Gauge. They feel with the Commissioners that "they cannot recommend the Legislature to sanction such an expense from the Public Monies, nor do they think that the Companies to which the Broad Gauge Railways belong can be called upon to incur such an expense themselves, having made all their works with the authority of Parliament, nor even the more limited expense of laying down intermediate rails for Narrow Gauge traffic."

Still less can they feel themselves justified in proposing that the expense of such alteration should be defrayed by a contribution levied, as has sometimes been suggested, on the rest of the Railway Companies in Great Britain; and they are unable to suggest any other equitable or practical means by which the desired uniformity of Gauge could be obtained.

The conclusion to which my Lords have come respecting the reduction of the Broad Gauge on existing Lines necessarily affects their opinion with regard to the future Gauge of Lines now in course of construction.

If the Line now extending from London to Exeter be preserved on the broad gauge and yet all the railways in connexion with it from the South, for which Acts have been obtained [*i.e.*, Berks and Hants and Wilts, Somerset, and Weymouth], are to be formed on the narrow gauge, then it is obvious that the inconveniences of the break of gauge will not only be continued but will be increased in amount.

Assuming that an absolute uniformity of gauge cannot now be obtained, they feel that the only practicable course to be pursued is to endeavour to effect such a settlement of the Gauges to be used on the several railways already sanctioned, and to lay down such general regulations for the future, as will prevent the increase and further extension of an evil they cannot altogether remedy, and will reduce the inconvenience inflicted on the Passenger and Goods traffic of the Country to the narrowest attainable limits.

They would therefore recommend that the Lines for which Acts have been obtained but which have not yet been completed to the South of the Line from London to Bristol should be permitted to be constructed on the Broad Gauge, as originally intended.

The Board then referred to the South Wales Railway, and stated that, though the case was attended with some difficulty, it was their opinion that on the whole it would be advisable that this line also should be made on the Broad Gauge, as originally sanctioned. With regard to the Oxford & Rugby Railway, they stated their intention to exercise the power given them by that Act to require the addition of narrow-gauge rails, and that therefore it was not necessary to interfere with the construction of the line on the Broad Gauge as authorised. The Oxford, Worcester & Wolverhampton Railway Act, it will be remembered, already provided for additional narrow-gauge rails north of the junction with the Birmingham & Gloucester at Abbot's Wood, near Worcester; so that also was not to be interfered with.

Thus the recommendations of the three Commissioners for the extinction of the Broad Gauge were considerably

watered down by the Board of Trade, and, as we shall see, were destined to be still further diluted by Parliament.

The House of Commons having passed resolutions embodying almost in the same terms the suggestions of the Board, a Bill was brought in to give effect to them, and after passing through the usual stages in both Houses, obtained the Royal Assent on the 18th of August, and became the Gauge Act, 1846. Of this Act the first section forbids the future construction of any railway for the conveyance of passengers on any gauge other than 4 feet 8½ inches in Great Britain and 5 feet 3 inches in Ireland. The second section, however, excepts from this prohibition "*any Railway constructed or to be constructed under the provisions of any present or future Act containing any special enactment defining the gauge or gauges of such railway or any part thereof*, or any Railway which is in its whole length southward of the Great Western Railway, or any Railway in any of the Counties of Cornwall, Devon, Dorset, or Somerset, for which any Act has been or shall be passed in this Session of Parliament, or any Railway in any of the last-mentioned Counties now in course of construction." Branches just authorised from West Drayton to Uxbridge, Maidenhead to High Wycombe, and from the Oxford, Worcester & Wolverhampton Railway to Witney, are also excepted, and the South Wales and Monmouth & Hereford Railways ordered to be made on the gauge of seven feet. Further sections provide "that it shall not be lawful to alter the gauge of any Railway used for the Conveyance of Passengers"; that the Oxford & Rugby and Oxford, Worcester & Wolverhampton Acts shall not be affected; and for penalties of £10 per mile of any railway constructed or

altered contrary to the Act “for every day the same shall continue so unlawfully constructed or altered.”

Now it will be observed that the words in italics, which were not contained in the recommendations of the Board of Trade or in the resolutions of the House of Commons on which the Act was founded, completely took the sting out of the Gauge Act, leaving, as they did, the question of the gauge of any new line open for the decision of the Committee on the Bill for its construction, and only enjoining the Narrow Gauge in cases where such Committee had not been persuaded to sanction the Broad. This meant leaving matters much as they were before, so that the Royal Commission and the whole agitation ended, in effect, in a mere expression of opinion.

To quote from a Report of the Railway Commissioners in 1848:

“Supposing the object of Parliament to have been to ensure, in its future Railway legislation, a conformity with the Resolutions defining the limits of the two Gauges, it would appear that this object might have been more effectually secured by embodying the substance of those Resolutions in the Standing Orders of the two Houses, rather than by passing an Act of Parliament on the subject. It must be obvious that Committees of the Houses, when considering the provisions which they may deem expedient to insert in Bills, cannot be bound by previous Acts of Parliament. But had the Gauge Resolutions been embodied in the Standing Orders, no Committee could have inserted any clause in a Railway Bill in contravention of those Resolutions without having made a previous application to the House for the suspension of Standing Orders, and without having obtained its deliberate decision to that effect. . . . Under the present system Committees are at liberty to take any course they think fit respecting the choice of Gauge, and the only means possessed by the House of enforcing the rule it laid down is by rescinding the decision of the Committee on the Bill after the whole of its labour has been concluded—a course which the House is naturally and properly unwilling to adopt.”

Thus did the Broad Gauge party succeed in spiking the

great gun of the enemy, to the intense annoyance of the latter. In the very next session a broad-gauge line from Oxford to Cheltenham as well as two short lines in South Wales were sanctioned by Parliament, with provisions, however, for the addition of the Narrow Gauge if required by the Railway Commissioners, and in 1848 the extension of the Broad Gauge to Birmingham and Wolverhampton was authorised on lines previously to be narrow-gauge only.

The facts remain, however, that these were all, potentially at any rate, double- or mixed-gauge railways, and that, although not forbidden by the Gauge Act, no exclusively broad-gauge lines outside the excepted district, other than short branches or extensions of branches, were passed by Parliament after 1846.

Moreover, the Board of Trade carried out the intention expressed in their Minute by an Order of the 25th July 1846, in exercise of their power under the Oxford & Rugby Act, requiring the Company to lay down narrow-gauge rails on that line in addition to the Broad Gauge.

Upon this the Great Western Directors considered the subject of forming a continuous narrow-gauge line from Oxford to Basingstoke in order to comply with the recommendation made by the Gauge Commissioners and confirmed by the Board of Trade Minute and the Resolutions of the House of Commons. They had an additional inducement to do this by reason of a project with the grand title of "The Manchester & Southampton Railway" then before Parliament; really it was for a narrow-gauge line from Cheltenham to Romsey. On the 19th August they resolved:

That upon a careful review of all the circumstances of the case—taking into account the heavy expense now imposed on this

Company by the Board of Trade in requiring them to lay down the Narrow Gauge for 50 miles from Rugby to Oxford, it is expedient to undertake to lay down in like manner Narrow Gauge Rails on the portion of the Great Western and Berks and Hants Railways between Oxford and Basingstoke, being about 40 miles, provided parliamentary sanction shall be refused to the Manchester and Southampton Railway Bill—which is projected for the purpose of diverting the North and South Traffic from the lines already sanctioned upon the plea of diversity of Gauge on such Lines.

That the Chairman be authorised to pledge this Company to such steps being taken to complete the chain of Narrow Gauge from North to South—in the event of the beforementioned Bill now before parliament being rejected.

This pledge was accordingly given by Russell, and the Manchester & Southampton project extinguished. Thus was the thin end of the wedge inserted, which was destined to bring down the whole broad-gauge edifice he, Saunders, and Brunel were building up with such pains.

5. THE BIRMINGHAM & OXFORD JUNCTION RAILWAY AND THE BIRMINGHAM, WOLVERHAMPTON & DUDLEY RAILWAY.

The Birmingham & Oxford line owed its origin entirely to the Grand Junction Company. Early in 1845 that Company determined on getting a communication with London independent of the London & Birmingham, with whom they had, as we have seen, long been at war. They accordingly projected a line from their Birmingham Terminus to join the Oxford Branch of the Great Western. In this they were supported by many of the iron masters, merchants, and manufacturers of the Birmingham District, who were thoroughly discontented with the London & Birmingham's alleged abuse of its monopoly, especially in the conduct of the goods traffic,

extortionate rates, and refusal to afford much needed additional accommodation.

The Grand Junction naturally sought the co-operation of the Great Western Directors, and the latter, after some hesitation, eventually gave them cordial support. In this they were influenced—so Saunders told the Gauge Commissioners—by the bitter hostility shown by the London & Birmingham and Midland Companies in the matter of the Oxford & Rugby Railway, “which was never intended to be a direct competing line adversely to the London and Birmingham,” and in the promotion or encouragement of lines whose only object could be to prevent traffic coming on to the Great Western, and, last but not least, in the effort being made to force the Broad Gauge off from Gloucester to Bristol; by all of which they were driven to conclude that no friendly interchange of traffic was possible. The new railway was to be broad-gauge, and the Grand Junction even proposed to add broad-gauge rails on their own line to Liverpool and Manchester, and had estimates of the cost made by their Engineer, as we have already seen.

By the Subscribers’ Agreement of the 15th April 1845, power was given to their Committee to enter into contracts for the sale or lease of the undertaking to the Grand Junction or Great Western Company, each of whom was empowered to nominate three members of the Committee, and stipulations were made for securing the railway as a rival to the London & Birmingham and keeping it out of their hands.

Later, on the sanction of the Oxford & Rugby Line by Parliament being assured, the Birmingham & Oxford was shortened to join that Railway near Fenny Compton instead of the Great Western at Oxford.

Thus matters stood till the Grand Junction made up their quarrel with the London & Birmingham, and agreed to an amalgamation on very advantageous terms. They then, of course, deserted their Great Western allies, withdrew their support from the Birmingham & Oxford, and disclaimed the acts of their officers, asserting that the Directors, Solicitors, Secretary, etc., who had actually promoted the scheme, had done so in their private capacity only.

Undeterred by this defection of the Grand Junction, and the consequent accession of strength to the opposition for the coming fight, the other parties who had embarked on the Birmingham & Oxford project determined to proceed with it and accordingly lodged their Bill for the Session of 1846. At the same time they deposited another Bill for a short branch to an independent terminus in the town of Birmingham.

The London & Birmingham opposed with a projected system of loop lines to accommodate the chief portion of the district, but the Birmingham & Oxford based their case on the need of a competing line, and this consideration greatly influenced the Committees in both Houses to prefer their scheme.

The Bills provided for a sale or lease to the Great Western Company only, the alternative power in favour of the Grand Junction being of course omitted. Now it so happened that before the Bills had passed the Commons Committee, another Committee, which had been appointed to report on the expediency of granting powers of amalgamation and leasing to Railway Companies, made a recommendation to the House that in all such cases the tolls of the Companies should be revised and reduced to the lowest scale actually charged or authorised

to be charged by either of them. The powers of sale or lease to the Great Western contained in the Bills brought that Company within the terms of this recommendation, but the technical difficulty that notice, necessary by Standing Orders, of an intended alteration of the Great Western tolls had not been given, of course not having been contemplated, prevented the Birmingham & Oxford Committee complying with the recommendation. The Bills were consequently reported to the House without any revision of the Great Western tolls. This gave the London & Birmingham opposition a chance, and they succeeded in obtaining a recommitment of the Bills in the hope of expunging the powers of sale or lease to the Great Western. The Committee, however, refused to oblige them, and got over the difficulty by inserting a proviso that such powers should take effect only when the tolls of the Great Western Railway should have been reduced by Parliament to the scale authorised by the Birmingham & Oxford Bills. They had another try at the Report stage in the House, but the Bills were passed and went up to the Lords without alteration.

In spite of violent opposition in the House of Lords, the two Bills passed all the stages, and received the Royal Assent on the 3rd August 1846.

The Birmingham & Oxford Junction Railway Act authorised a railway from a junction with the London & North Western Railway, which, by the way, had only been constituted on the 16th July, in the town of Birmingham, to a junction with the Oxford & Rugby Railway in the Parish of Fenny Compton, and also a branch from Finwood Green, in the Parish of Rowington, to a junction with the Oxford, Worcester & Wolverhampton's authorised Stratford Branch at Stratford-on-Avon.

The Birmingham Extension Act was for a railway in the town of Birmingham from a junction with the Birmingham & Oxford Railway at Adderley Street to Great Charles Street, with a station between Snow Hill and Livery Street and Monmouth Street and Great Charles Street, and provided that the portion between Moor Street and Monmouth Street should be covered by a tunnel with no opening therein, and that the whole railway should be amalgamated with the Birmingham & Oxford on the passing of the Act.

The capital authorised by the former Act was £700,000 and by the latter £300,000, making a total of £1,000,000, in £20 shares.

Neither Act makes any mention of the gauge of the railways; consequently under the Gauge Act there was no power to make them on any other than the Narrow Gauge. The reason for this was that, in view of the Gauge Commissioners' Report and the Government Bill to carry out their recommendations against the extension of the Broad Gauge, which was actually in Parliament at the time, it was not thought prudent to press a clause authorising Broad Gauge on the Birmingham & Oxford.

On this same 3rd August the Royal Assent was also given to the Bill for the Birmingham, Wolverhampton & Dudley Railway. This line was first projected somewhat later in the year 1845 than the Birmingham & Oxford. Its promoters were to a great extent the same as those of the latter, and it was strongly supported by the mining and manufacturing interests of the Black Country, which it traversed, and also, it may be noted, by the Oxford, Worcester & Wolverhampton Company. This Bill also, of course, encountered desperate opposition

from the united forces of the London & Birmingham and Grand Junction Companies, and was met by competing schemes of theirs, but eventually passed both Houses together with the competing Birmingham, Wolverhampton & Stour Valley Railway of the London & North Western and Shrewsbury & Birmingham Companies.

The Act authorised a railway from Monmouth Street between Livery Street and Snow Hill in Birmingham to a junction with the Oxford, Worcester & Wolverhampton Railway near Priestfield Furnaces, in the Parish of Wolverhampton, and from "The Cross Guns," in West Bromwich Parish, to "The Trindle House" in Dudley; but provided that, as the portion of the latter line between Great Bridge and Dudley was identical with the main line of the South Staffordshire Railway—authorised on the same day—the Birmingham, Wolverhampton & Dudley Company should not make that line unless the South Staffordshire failed to do so within three years. They were, however, to have running powers over that part of the South Staffordshire, and the latter Company was given similar powers between Wednesbury and Priestfield.

As in the case of the Birmingham & Oxford, and for the same reasons, no clause specifying the gauge appeared in the Act, though from the beginning this was intended to be the broad; hence the Birmingham, Wolverhampton & Dudley as originally sanctioned would have had to be a narrow-gauge line like the Birmingham & Oxford.

An important difference in the constitution of the two Companies was that no power of sale or lease to the Great Western or any other Company was contained in the Birmingham, Wolverhampton & Dudley Act.

It may be noted in passing that the two lines overlapped between Monmouth Street and Great Charles Street, Birmingham, so that each Company had equal rights over the site of the proposed station at Snow Hill. The authorised capital of the Birmingham, Wolverhampton & Dudley Company was £700,000 in £20 shares.

Very soon after the incorporation of the Companies it became obvious to their Directors that, one line being a continuation of the other, both starting from the same station in Birmingham, and both being rivals to the London & North Western and having many shareholders and directors in common, an amalgamation would be for the mutual interest. Accordingly they agreed to amalgamate on equal terms, and gave notice that the proposal would be submitted to the shareholders at the first meeting of each Company, appointed for the 30th October.

The Birmingham & Oxford Directors made no proposal of selling their line to the Great Western at this time, being of opinion that the value of both lines would be enhanced by a previous amalgamation, but at the Meeting several shareholders advocated an immediate sale of the line. To this the Directors demurred. Eventually a resolution was passed sanctioning an amalgamation with the Birmingham, Wolverhampton & Dudley, and authorising the Directors to apply for an Act to carry it out and to sell or lease the two lines when amalgamated to the Great Western, "the Directors being requested and authorised at once to negotiate with that Company for some arrangement for that purpose."

At the Birmingham, Wolverhampton & Dudley Meeting on the same day resolutions similar in effect were passed.

Deputations of the Directors of both Companies accordingly proceeded to negotiate with a Deputation of Great Western Directors, and terms were agreed to on the 12th November, and afterwards confirmed by the Boards of the three Companies.

These terms were that the Great Western should buy the two undertakings by payment of £30 5s. for each £20 share of the combined capital of £1,700,000, a premium of £10 5s. per share, payable within six months of the opening or on the 1st July 1850, with 5 per cent. interest from that date, and similar interest on all calls punctually paid during construction. Any further capital required was to be found by the Great Western, who were to have effectual control over the expenditure. Last, but not least, powers were to be obtained for the Broad Gauge in addition to the Narrow.

As far as regards the Birmingham, Wolverhampton & Dudley, this agreement, of course, required the sanction of Parliament, but in the case of the Birmingham & Oxford it had been authorised in advance by their Acts, and therefore came into effect immediately it had been ratified by a General Meeting.

As soon as they had been confirmed by the respective Boards these terms were made public; and Special Meetings of the three Companies to consider them were called for the 4th December.

At the Great Western and Birmingham, Wolverhampton & Dudley Meetings the proposed agreement was approved and confirmed without any difficulty, but at that of the Birmingham & Oxford there was opposition in favour of opening negotiations with the London & North Western.

On the very eve of the three meetings Russell had

received a letter from G. C. Glyn, Chairman of that Company, enclosing a copy of a reply he had just sent to certain Birmingham & Oxford shareholders, in which he suggested a joint lease to his own and the Great Western Companies, and added that if the latter would not agree to this the North Western Directors would make proposals on their own account "when the present offer of the Great Western is disposed of." He asked for an immediate conference. To this Russell at once replied declining both the joint lease and the conference. This correspondence was read at the Birmingham & Oxford Meeting by the Chairman, P. H. Muntz, who then explained the negotiations with the Great Western Directors, and moved the confirmation of the agreement. An amendment was proposed for the adjournment of the Meeting to the 14th January, on the ground that the sealed share certificates had not yet been issued, and that numerous purchasers of shares had therefore been unable to complete their purchases so as to vote at the Meeting. The opposition alleged that the delay in issuing the certificates was intentional on the part of the Directors. This was denied by them and the Secretary, who ascribed the delay entirely to the printers, and stated that he had registered all transfers sent in without certificates. As the charge was denied on oath in the subsequent lawsuits, and appears to have had no influence with the Courts, it may be disregarded. The leader of the opposition, Elias Mozley, a banker in Liverpool and a North Western shareholder, in support of the adjournment read a letter from Glyn, by which a premium of £15 per share was suggested on behalf of the London & North Western. Notwithstanding this, the amendment was eventually negatived, and the Chairman's

motion ratifying the Great Western Agreement carried by the requisite three-fifths majority. This at once made the agreement binding as far as the Birmingham & Oxford and Great Western Companies were concerned, and the Directors then proceeded to draw up a more formal deed, which was sealed on the 2nd January 1847.

Refusing to recognise this fact, Mr. Glyn wrote to the Birmingham & Oxford Chairman shortly after the Meeting renewing the proposal of a joint lease and, failing that, offering on behalf of his Company to purchase the line at £15 premium on each share. In reply the following resolutions of the Birmingham & Oxford Directors were communicated to Mr. Glyn by the Secretary :

18th December 1846.

Resolved that Mr. Glyn be reminded that this Company has contracted to sell the Birmingham and Oxford Line to the Great Western Company and that he be informed that the Board is unanimously of opinion that under such circumstances the offer contained in his letter of the 16th instant ought not to have been made.

That the Board is further of opinion that Parliament, mindful of the policy which actuated it with reference to these Lines last Session, would refuse its consent to any such arrangement as that proposed by Mr. Glyn on behalf of the London and North Western Company, and entertain no doubt of its sanctioning the arrangements completed by this Company for the purpose of carrying out this policy.

That the general interests of trade and the public imperiously call for the exclusion of the influence of the London and North Western Company from the management of any and every portion of a second line from London northwards.

On the receipt of this snub Captain Huish, who was now General Manager of the whole London & North Western Railway, and his Directors redoubled their efforts to acquire not only an influence but a controlling

interest in the management of the rival line. They had begun buying shares in the Birmingham & Oxford about the time of the Meeting of 4th December, but were just too late, and this was no doubt the reason of the clamour about the non-issue of certificates and the proposal to adjourn the Meeting. From this time the purchases were carried on to such an extent that out of the whole 50,000 shares in the Birmingham & Oxford Company nearly 40,000 had very soon been acquired by their agents, many at as high a premium as £11 per share. To make things doubly sure by increasing their voting power, these purchases were split up in lots of ten—up to which number each share carried a vote—among their Directors, shareholders, officers, engineers, solicitors, clerks, and servants. Indeed, it was said at the time that most of the Euston porters were shareholders in the Birmingham & Oxford.

Having thus obtained a sweeping majority of votes in the Company, the next endeavour of Mr. Elias Mozley and other North Western agents was to obtain a majority on the Board. The number of Directors at this time was twelve, but there was power in the Act to increase this to eighteen or lessen it to six.

Mr. Mozley assumed that at the February Half-yearly Meeting four of the Directors appointed in October would retire by rotation, and that he could supply their places by nominees of his own. Still he would be in a minority of four to eight, so to overcome this it was intended to exercise the power of increasing the number to eighteen by electing six Directors of his own party, and so secure a majority of ten to eight. Accordingly he sent a requisition to the Directors to call an Extraordinary Meeting for the purpose of increasing the Board

to eighteen, which they did for the 13th March, the ordinary Half-yearly Meeting being already fixed for the 27th February. Meantime the Directors took Counsel's opinion, and were advised that none of the Directors elected in October should retire in February, the only doubt being whether they should retire in the following October or February 1848. The Half-yearly Meeting on the 27th February was adjourned after some talk to the day appointed for the Extraordinary Meeting. This was held on the 13th March at Dee's Royal Hotel, Temple Row, Birmingham. Six new Directors were duly—and quite legally—elected, and various instructions to stultify all their former proceedings given to the Board by the Proprietors, most of whom had arrived by special train from Euston. The Half-yearly Meeting was then held; someone proposed that a third of the old Directors should retire at once, which was carried with acclamation when put to the Meeting by the Proposer on the refusal of the Chairman to do so. The Directors sat still, and the Proprietors, having on the motion of Mr. Elias Mozley expressed their dislike of them and their behaviour in suitable terms, betook themselves to Curzon Street Station, where their special train was waiting.

Since the December Meeting three Bills had been lodged in Parliament for the Session of 1847 to carry out the Agreement of the 12th November: one by the Birmingham, Wolverhampton & Dudley Company to authorise the sale of their line to the Great Western; another by the Great Western to enable them, among other things, to purchase that line and to effect the reduction of their tolls required by the Birmingham & Oxford Act as a condition of the amalgamation; and a third for amalgamating the Birmingham & Oxford and Birming-

ham, Wolverhampton & Dudley into one Company under the title of "The Oxford, Birmingham & Wolverhampton Railway Company," and empowering it to sell the Birmingham, Wolverhampton & Dudley to the Great Western. The first two duly passed and became Acts of Parliament in July, but the third, having passed the Commons, failed in the Lords on the Wharncliffe Standing Order, which required the approval of the Bill by a General Meeting of the Birmingham & Oxford shareholders, of course quite impossible to obtain. In the circumstances, however, its failure was not of much importance, as the Great Western had now obtained the power to purchase the Birmingham, Wolverhampton & Dudley, which had been lacking, and was as capable of making two mouthfuls of the Companies as of swallowing both at one gulp.

In the meantime the original Directors of the Birmingham & Oxford, feeling that their position at variance with the vast majority of their shareholders was somewhat curious and required public explanation, presented a Petition to the House of Lords in March setting out the facts of the case and praying for an inquiry into their allegations. This led to a Debate in that august assembly in which Lords Lyndhurst, Brougham, Lansdowne, and others supported a motion for an inquiry, while Lords Stanley and St. Germans opposed it on behalf of the dissentient shareholders and the London & North Western Railway respectively. In the result, a Select Committee of five independent peers was appointed, but before they could take up the matter, Chancery proceedings were commenced by some of the opposition, so the inquiry was left to the Law Courts. The object of the suit was to upset the Agreement of November, to

restrain the Directors from acting on it, and to force four of them to retire. The appointment of the six new Directors had not done the enemy much good, as the business of the Company was carried on by a committee of five, whom the old Directors had cunningly appointed for the purpose before the March Meeting. This was, of course, a special grievance.

The pleasant gatherings at Dee's Hotel were resumed at the requisition of the opposition on the 12th June, adjourned to the 19th then to the 30th June and 12th July successively, in each case without any business being disposed of. It was not till a further adjournment to the King's Arms, Westminster, on the 24th July, that the Euston troupe really got to work, and appointed a solicitor named Dobie to bring actions in the name of the Birmingham & Oxford Company against the old Directors for the cancellation of the Agreement, to restrain them from acting at all in the affairs of the Company, and to compel them personally to reimburse to the Company all sums expended in carrying out the Agreement or promoting the recent Bill in Parliament. Further, they "deemed it highly unfit that any more of the funds of the Company should be placed under the control of such parties," and so protested against the call of £5 per share lately made by "such parties" and recommended the shareholders not to pay it. To enable them to act in the name of the Company, they had even forged an imitation of the Common Seal, which was produced at the Meeting and duly declared



THE GENUINE SEAL

to be the only common seal of the Birmingham & Oxford Junction Railway Company!

As the non-payment of the call would have the effect of suspending the works of the railway, and causing them much loss and inconvenience, the Great Western Directors thought it was now time for them to take a decisive hand in the fray. So towards the end of August the Great Western Company filed a Bill in Chancery against the Birmingham & Oxford Company, all its eighteen Directors by name, and the Birmingham, Wolverhampton & Dudley Company, for specific performance of the Agreement of the 12th November 1846, and an injunction restraining the Birmingham & Oxford Company and its Directors from attempting to make any arrangement for the sale or lease of the line to the London & North Western Company, or doing anything to prevent payment of the £5 call or inconsistent with the Agreement. The twelve old Directors and the Birmingham, Wolverhampton & Dudley Company were of course friendly but necessary Defendants.

On the 4th December the Vice-Chancellor gave final judgment in favour of the Great Western on all points, and granted the injunction asked for. An appeal to the Lord Chancellor was dismissed with costs in January 1848, after which Captain Huish and his Directors threw up the sponge, and the civil war in the Birmingham & Oxford Company fizzled out.

Meantime, in consequence of the agitation carried on in and out of Parliament for a broad-gauge line to Birmingham, the House of Lords, in June 1847, ordered the Railway Commissioners, a short-lived Ministry of Transport of the period,¹ to inquire into the existing railway

¹ They functioned from 9th November 1846 to 10th October 1851, when their powers were resumed by the Board of Trade.

communication between London and Birmingham, and to report to the House early in the next Session how the interests of the public might best be secured, and whether it was expedient that the Broad Gauge should be extended to Birmingham.

This led to another battle, conducted on this occasion like a suit in Chancery by written statements and replies, between the Great Western and London & North Western champions. Each Company was invited by the Commissioners to submit a statement of its views, and this was forwarded to be contradicted and generally torn to ribbons by the other. The Great Western, while deprecating this method of inquiry as not likely to elicit the truth, dwelt on the necessity of Broad Gauge on the Birmingham & Oxford for effective competition and the absurdity of creating a needless break of gauge at Fenny Compton or Oxford, and forwarded an influentially signed memorial from many prominent manufacturing firms of Birmingham and the Black Country. The North Western objected to what they called a reopening of the Gauge question, supposed to be settled in their favour; expressed their desire for the amendment of the Gauge Act; were unable to see the need for any competing line—certainly not for a broad-gauge one; and pointed out that their Engineer, Robert Stephenson, had conclusively shown that a mixed-gauge line could not be worked. This last view, if really believed, should have led them to encourage its establishment. A very distinct fear of the competitive value of the Broad Gauge on the rival line is manifest throughout their communications.

This paper warfare having been brought to an end, the Commissioners in January 1848 sent to each Company, for the opinions of their respective Engineers and

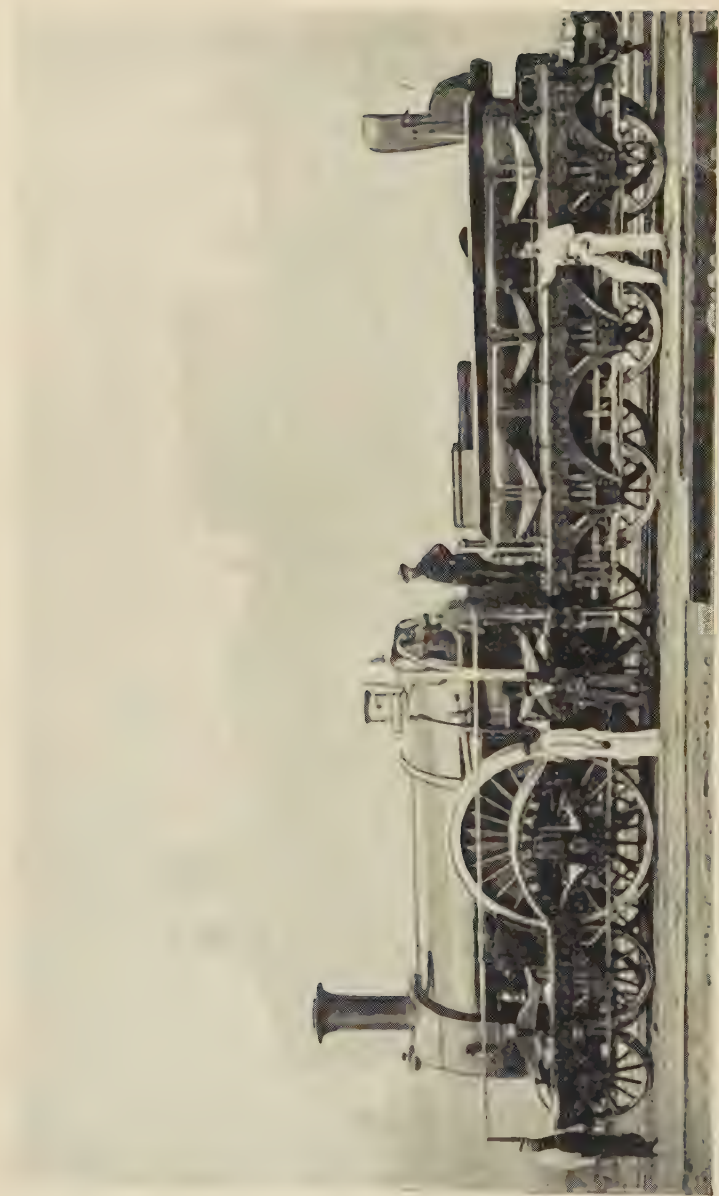
Locomotive Superintendents, a series of twenty-three questions as to the design, power, and speed capacity of engines and the resistance of trains at different speeds. The replies of the North Western officers, Stephenson, Locke, McConnell, and Trevithick, are singularly short and jejune, while Brunel and Gooch, especially the latter, went deeply into the subject and replied at considerable length. For estimating the resistance of trains, Gooch constructed an elaborate Dynamometer Carriage, and made a series of twenty-six experiments at various speeds on a mile of straight and level line west of Banwell Station¹ on the Bristol & Exeter, with his new *Great Britain* 8 foot single engine, and a train of nine carriages loaded with iron to make a total weight of 100 tons. The resulting diagrams were all printed by the Commissioners, and form the greater part of the Appendix to their Report.

In this document they agree with the Gauge Commissioners :

That a break of gauge is a most serious impediment in the transport of merchandize, and that the Broad Gauge does not offer any compensating advantage, so far as that description of traffic is concerned. They do not consider that the experience which has been obtained since that Report was made affords any grounds for modifying this opinion. No means have been adopted to mitigate the evil of a break of gauge; and although the power of the engines on both gauges may have been increased, particularly of those on the Broad Gauge, the effect of such increase has been principally shown by the increased speeds of the Express Trains; and it does not appear to have produced any material difference in the relative advantages of the two gauges for Merchandize Traffic.

As to passenger traffic they have a different story to tell. Since the Gauge Report the Great Western engines had been much improved, and seven of Gooch's great 8 foot singles were at work.

¹ Now called "Puxton and Worle."



"SULTAN" 1847. A sister engine to "Great Britain"

But it is notorious that higher speeds with larger and heavier Passenger Trains are regularly maintained on a part of the line of the Great Western Railway than on any other railway in the Country. The fact is known and greatly appreciated by a very large portion of the Public; and no opinion respecting the extension of the district within which the Broad Gauge should be adopted is likely to be received with confidence which is not founded on a full consideration of the circumstances to which the above fact is to be attributed, and of the extent to which, under differing circumstances, if attributable to the breadth of gauge, the gauge of the Great Western Railway offers this advantage.

The comparative efficiency of the broad- and narrow-gauge engines of the period is then discussed at some length, and the conclusion arrived at that the former "can draw an ordinary Passenger Train of sixty tons weight with as much facility on a level at sixty miles per hour as the narrow gauge engines can at fifty."

On moderately descending gradients the larger engine would possess a similar degree of advantage; but in proportion as the inclination increased and considerations of safety imposed a limit to the speed the advantage would diminish and disappear.

On rising gradients the Commissioners thought that the difference in power between the two engines diminishes gradually up to an incline of 1 in 170, on which "the two engines would have nearly the same power over a train of 60 tons, and on steeper gradients the greater weight of the larger engine would cause the difference to be in favour of the smaller engine."

Such appear to the Commissioners to be the advantages which the Broad Gauge at present offers; and although they cannot consider them sufficient to compensate the evils attendant on two gauges, if it were now possible to obtain uniformity, yet as two are established it appears to them that it might be expedient and for the public interest on account of those advantages to extend the Broad Gauge to Birmingham, although such extension is contrary to the strict interpretation of the Resolutions of the two Houses of Parliament on which the Gauge Act was founded. . . .

There are strong reasons against the exclusive use of the Broad Gauge on the line between Fenny Compton and Birmingham; the injury that arrangement would inflict on the traffic of Aylesbury and the surrounding district and the complete change it would occasion in the conditions under which the Buckinghamshire Railway is being proceeded with, appear to the Commissioners to prohibit such a proposition from being entertained.

The Buckinghamshire Railway was formed in 1847 by the amalgamation of the Buckinghamshire & Brackley and the Oxford & Bletchley projects of 1846, relics of the system of loop lines with which the London & Birmingham Company sought to oppose the Birmingham & Oxford Junction Railway. It had powers to make lines from Aylesbury to Banbury and from Bletchley to Oxford, and was entirely a creature of the North Western, who had projected the extension to Banbury at the time they had hope of capturing the Birmingham & Oxford. The branch from Aylesbury, needless to say, was never made.

Moved by these "strong reasons," which, as the Buckinghamshire had no running powers over either the Oxford & Rugby or the Birmingham & Oxford, are not so apparent as they seem to have been to the Commissioners, the latter "consider it is only by the use of the Mixed Gauge that the disadvantages of the route between London and Birmingham by Oxford can be effectually removed." Influenced obviously by Robert Stephenson's opinions on the subject, they were, however, very diffident about making this suggestion, and proceed:

Although the Commissioners believe that the introduction of the Mixed Gauge on the Birmingham and Oxford Line will, if practicable, prove advantageous to the public interests, they cannot recommend to the House of Lords that it should be at once sanctioned. Its success has not yet been proved; and although they feel it difficult to believe that the same skill and

energy, which has within the last few years so successfully surmounted the numerous impediments, which in the development of an entirely new means of communication must have arisen, will not also surmount the mechanical difficulties attending the details of the Double Gauge, they nevertheless consider that, while reasonable objections are expressed respecting its success by eminent engineers, they cannot advise the Legislature to act until a sufficient experiment has been tried.

Such is the gist of the somewhat timorous report which the Railway Commissioners presented to the House of Lords in May 1848.

When these Commissioners first took over the functions of the Board of Trade in November 1846, they found themselves faced with the problem of deciding how the narrow-gauge rails, ordered by their predecessors to be added to the Oxford & Rugby Railway, should be laid, the Oxford & Rugby Act having provided that these, if ordered, should be laid in a manner approved by the Board. They accordingly asked the Great Western for a description of the method proposed to be adopted, and in January 1847 received Brunel's views on the subject, in which he recommended a single additional rail on each line and that the outer rail of each should be common to the two gauges. These they, strangely enough, then submitted to the London & North Western Company for the remarks of their Engineer, in order, they said, "that the interests of the Narrow Gauge Companies, *who might require* to use the line, might be duly considered." After taking six months to consider the matter—it was obviously not in the North Western's interest to accelerate progress—Stephenson sent in some very lengthy and elaborate "Observations," in which he took advantage of the opportunity to inveigh generally against the mixture of the gauges and express his well-known strong

opinions thereon, to foresee numerous difficulties, and to predict serious results.

To these "Observations" Brunel replied curtly that the Mixed Gauge had never been proposed by the Great Western, but had been ordered by Parliament and the Board of Trade, and therefore the question now was not whether the London & North Western Engineer liked it, but simply as to the mode in which the Railway Commissioners might approve of such mixture being effected. He denied the correctness of nearly all Stephenson's calculations and figures and strongly deprecated the Commissioners having consulted him, an officer of a violently hostile Company, instead of some more impartial engineer. If, said he, the plans for the construction of some works by the North Western Company were submitted by the Commissioners to the Great Western for criticism, "and if I as their Engineer were to avail myself of such an opportunity, I have little doubt that I could, without the exercise of much ingenuity, throw such doubts upon the safety or the expediency of those works as would seriously embarrass the decision of the Railway Commissioners who had thus consulted me, and thereby impede the progress of the London & North Western Railway Company." He added that a portion of railway with crossings, switches, and sidings of the Mixed Gauge had more than six months previously been laid down for the inspection of the Commissioners on the Great Western main line at Ealing, where it had ever since been, and still was, subject to the constant passage of the whole of the traffic.

The matter was then referred by the Commissioners to Captain Simmons, R.E., who, after considering Brunel's proposals and Stephenson's criticisms, agreed with the

former that the three rail system was the simplest mode of uniting the gauges, as being less intricate and expensive, more easily kept in repair, and with certain precautions more safe than four rails. In conclusion he "conceived that the Gauges may be combined in one railway with perfect safety to the public," but suggested their separation in sidings used for standing spare vehicles, and the entire prohibition of running carriages of different gauges in the same train, which had never been intended or even suggested by anyone but the opposition.

Lacking courage to adopt the report of their own officer, the Commissioners then—November 1847—wrote to the Great Western Company that "it would be very desirable to delay for a time the decision of the mode in which the two gauges were to be combined." To this the Company naturally replied that it was important to them that it should be decided without any more loss of time; whereupon the Commissioners threw the responsibility on Captain Simmons by formally appointing him "Inspector-General for the purpose of performing the duties of that [otherwise extinct] office under the Oxford and Rugby Act."

So matters stood when the Great Western brought forward their Bill for further powers to carry out the Agreement of 12th November 1846 for the purchase of the Birmingham & Oxford Junction and Birmingham, Wolverhampton & Dudley Railways; this, of course, included the laying of Broad Gauge on those lines from Fenny Compton to Wolverhampton.

The North Western Chairman having promised that his Company would refrain from further hostilities, their opposition in the Commons was indirect in the name of

the Buckinghamshire. Having heard evidence and considered the Railway Commissioners' Report, the Committee reported to the House on the 6th June that they concurred with the Commissioners as to the expediency of extending the Broad Gauge to Birmingham and Wolverhampton on the grounds stated in the Report, especially "inasmuch as it is only by the use of the Mixed Gauge that the disadvantages of the route by Oxford can be effectually removed, and the adoption of the Mixed Gauge will probably render the Line from Birmingham by Fenny Compton to London as a Broad Gauge Railway as rapid a communication as the direct line." They recommended, however, that no extension beyond Wolverhampton should be authorised till the line had been completed and its practical working fully tested by experience. Pointing out that the mixed-gauge Line between Gloucester and Cheltenham had been worked with safety for several months by two hostile Companies, they disagreed with the characteristic suggestion of the Commissioners that the decision should be postponed, "which appears to have been suggested to the Commissioners rather on account of objections still expressed by some eminent engineers than from any doubt as to the means of surmounting mechanical difficulties attending the details of the Mixed Gauge." They thought, however, that the Commissioners should be given authority to supervise these mechanical details, and inserted a clause for that purpose.

Their report concludes :

The Committee attach much importance to the fact represented to them that this Bill will probably terminate a course of long and expensive litigation between public companies and individuals, to which the contest about the gauges has unhappily given rise ; it has been proved in evidence that the dissentient shareholders

of the Birmingham & Oxford Company, who had previously opposed the Great Western Company in respect to that Railway, have arranged all differences and consented to the powers being given for a mixed gauge over the line; and it seems to the Committee most expedient on that as well as the other more important grounds of public advantage already stated that no further delay should take place in giving Parliamentary sanction to carry out the Agreement between the Companies for the possession of the Line by the Great Western Company, and for the extension of the Broad Gauge over it as well as to secure the performance of every other condition in the purchase of the two undertakings, which object has been attained by other clauses in the Act to the satisfaction of the Committee.

The Bill passed the Commons and went up to the Lords, where the London & North Western joined the Buckinghamshire in opposing it, notwithstanding their Chairman's promise. By the Select Committee of the Lords their opposition to the preamble and to the laying of the Broad Gauge was dismissed, but they succeeded in obtaining running powers, with "all proper and convenient accommodation in respect of stations, sidings, waiting and watering places and other facilities," over the narrow-gauge rails of the two lines, and also of the Oxford & Rugby Railway between Fenny Compton and Banbury, for "engines and carriages to and from the several narrow-gauge railways which do or shall communicate therewith respectively." In furtherance of these powers, they prevailed on the Committee to insert a clause that it should not be lawful for the Great Western to use the authorised broad-gauge rails until they had "completed and opened a communication between the line of the said Birmingham & Oxford Junction Railway and the line of the London & North Western Railway in the town of Birmingham, or within one mile on the south side thereof, by means of a double line of Narrow Gauge rails."

With these clauses the Bill passed the House of Lords, and received the Royal Assent on 31st August 1848.

The running powers were never exercised or intended to be exercised. They were inserted, nominally on behalf of the Buckinghamshire Railway, merely out of spite to hamper the victors; for this we have the authority of Robert Stephenson himself, in his evidence before the Committee on Railway and Canal Bills in February 1853, confirmed by the minutes of the Lords' Committee on the Bill. It is fair to add that Stephenson disclaimed all responsibility for the clauses, which he ascribed to the North Western Solicitor, Carter.

While on this subject, the story of this compulsory communication with the London & North Western in Birmingham may as well be related. It will be remembered that the Birmingham & Oxford Railway authorised by the Act of 1846 started from a junction with the London & North Western in Birmingham. This junction was close to the original terminus of the Grand Junction Line adjoining that of the London & Birmingham at Curzon Street. Soon afterwards the North Western obtained powers to extend their line farther into Birmingham and make a large passenger station at New Street, or Navigation Street as it was then called, in connection with the Stour Valley Line. This extension line cut across the authorised Birmingham & Oxford, almost at right angles outside the Curzon Street Stations, which were to be altered and abandoned for passenger traffic. It was owing to these circumstances that the line of the compulsory communication between the two railways was purposely left undefined by the Act of 1848, as it was necessarily dependent on the station arrangements of the North Western.

As the works of the Birmingham & Oxford progressed, it became essential that the mode of junction should be settled and the line made, in order to comply with the latter Act and enable the main line to be opened. Brunel accordingly planned a short line of only 14 chains to join the North Western near the mouth of the tunnel which forms the approach to New Street Station, and a Bill for the necessary powers was deposited for the Session of 1851. This was hotly opposed by the North Western on the grounds of the danger of such a junction and of an alleged insidious design of the Great Western to avail themselves of the new North Western Station and the Stour Valley Railway to Wolverhampton in order to save the expense of making their own line. The Great Western, they said, already had power to make the compulsory communication under the Act of 1846, and the point of junction authorised by that Act was a convenient one. The Bill, which also provided for a junction at Leamington, passed the House of Commons, but was thrown out by the Lords.

Hence the Great Western were driven to make the junction branch, originally sanctioned in 1846 as part of the main line of the Birmingham & Oxford Railway, from Adderley Street, where Bordesley Station now stands, to the site of the old Grand Junction Terminus at Curzon Street. This they forthwith proceeded to do, serving the usual notices on the parties interested. But the junction, described to the House of Lords as a convenient one in July, had become extremely inconvenient in August, and the North Western Company at once applied to the Court of Chancery to restrain the Birmingham & Oxford from taking possession of any of their land for the purpose. It was then arranged that the mode of crossing the North

Western Extension Line to New Street on the level and the junction beyond should be referred to the Companies' Engineers, Messrs. Stephenson and Brunel, for settlement, with power to appoint an arbitrator in case they disagreed. The construction of the branch, some 50 chains in length and wholly on arches over the town, was meantime proceeded with. At the opening of the main line to Snow Hill in October 1852 some of the arches were still



DUDDESTON VIADUCT, BIRMINGHAM, FROM BORDESLEY STATION

in progress, but in the following February Brunel reported that it had been constructed up to the edge of the London & North Western Company's property. The junction was never made. Neither Company wanted it, but the Great Western was forced to make the branch as a condition of working their main line by the action of the North Western in 1848. And so the derelict Duddeston Viaduct or most of it still stands, a melancholy monument to the ill-conditioned spite of a great Railway Company against a victorious rival in the old fighting days.

The victory of 1848 did not quite put an end to the Gauge War in the Black Country. We have seen that, notwithstanding its name, the Birmingham, Wolverhampton & Dudley Railway reached neither Wolverhampton nor Dudley. The main line terminated at Priestfield, more than a mile from the former town, by a junction with the Oxford, Worcester & Wolverhampton, then regarded as a loyal member of the Broad Gauge family and leased to her parent, the Great Western. Two years later, however, the daughter rebelled, and by the end of 1851 was at open and bitter war with the parent. She even proposed to abandon her own line into Wolverhampton and to reach that town by running over the Stour Valley Railway of her new friend, the London & North Western, from Tipton. This would of course have left the Birmingham, Wolverhampton & Dudley in the air at Priestfield, so the Great Western applied to Parliament for powers to make this portion of the Oxford, Worcester & Wolverhampton themselves. These were denied them, the House of Commons Committee preferring instead to bind the Oxford Company under heavy penalties to complete their mixed-gauge line from Priestfield to Wolverhampton, and on to the point now known as Cannock Road Junction, rather more than half a mile beyond in the direction of Bushbury. In the same Session (1852) the Great Western obtained an Act authorising the construction, also on the Mixed Gauge, of the Wolverhampton Junction Railway, about three quarters of a mile long, from this point to a junction with their Narrow Gauge ally, the Shrewsbury & Birmingham, at Stafford Road. It was not, however, till the following year that the Great Western secured statutory running powers over this intervening bit of the Oxford,

Worcester & Wolverhampton between Priestfield and Cannock Road, although they and the Shrewsbury & Birmingham were equally interested with the Oxford in the joint Low Level Station to be constructed on it. In 1854 further powers were obtained to add broad-gauge rails on about a mile of the Shrewsbury & Birmingham line from the junction at Stafford Road into their Victoria Basin Depot, with sidings there for the convenient interchange of traffic.

This was the last extension authorised, so the farthest point towards the north ever reached by broad-gauge rails was about a quarter of a mile beyond the Stafford Road Junction. They were never laid from Wednesbury to Dudley. As we have seen, the Birmingham, Wolverhampton & Dudley Railway's proposed branch to Dudley coincided with the main line of the South Staffordshire Railway, and exclusive authority to make the line was given to the latter Company, the former having to be content with power to use it. This was in 1846 when the Birmingham, Wolverhampton & Dudley was to be a narrow-gauge line like the South Staffordshire. The Act of 1848 which authorised Broad Gauge on the Birmingham, Wolverhampton & Dudley made no reference to this piece of the South Staffordshire. In 1852 the Great Western applied to Parliament for power to lay the Broad Gauge on this section without success. The attack was renewed in the next year, only to be finally defeated by the opposition of the owning Company and their lessee, J. R. McClean, who, curiously enough, was also the Engineer engaged in the construction of the Birmingham, Wolverhampton & Dudley line itself.

In 1854 a projected mixed-gauge branch from the Great Western at Wednesbury to the Cannock Chase

coalfield was also rejected by the House of Commons in favour of a rival South Staffordshire project, after which no further effort to extend the Broad Gauge in the Midlands was ever made.

6. THE FIGHT IN THE SOUTH

The long war between the Great Western and its ancient enemy the London & Southampton, which had changed its name to the London & South Western Railway in 1839, began in the Parliamentary Session of 1844 with a skirmish for the honour of providing railway accommodation to the town of Newbury. The Great Western proposed a branch from Pangbourne; the South Western one from Basingstoke with a suggested extension to Swindon. The fight was drawn, the Great Western Bill being thrown out by the Commons on landowners' opposition and the South Western by the Lords' Committee, who after a lengthy inquiry preferred the Great Western plan as the better route from London as well as forming with their Oxford Branch a link in a needed line of communication between the South Coast and the North of England far better than any by way of Swindon and Cheltenham.

With pacific intent Russell then wrote to the South Western Chairman, William Chaplin, suggesting a joint line between the South Western at Basingstoke and the Great Western between Pangbourne and Reading with a branch from it to Newbury, the whole being laid with a third rail to form the Mixed Gauge and so take both Companies' stock.

This olive branch being rejected, each Company prepared for a general attack all along the front in the following Session.

At first the Great Western proposed lines from Reading to Basingstoke and Newbury, called the Berks & Hants Railway, and from Corsham to Salisbury with branches to Devizes, Bradford, and Frome and a "coal line" from Frome to Radstock, called the Wilts & Somerset Railway. The main object of this Corsham and Salisbury line stated in the Directors' Report of August 1844 was to afford, in conjunction with the South Western's authorised branch from Bishopstoke to Salisbury, a communication between Bristol and Bath and Southampton, Portsmouth and the Isle of Wight, "superior in every respect to any railway which could be made between Basingstoke and Swindon." In addition to these Great Western proposals, the Bristol & Exeter Company were to make a line from near Taunton to Yeovil and on to Weymouth.

In the course of the autumn these projects were somewhat altered. The Newbury Branch of the Berks & Hants was extended to Hungerford, and, the Bristol & Exeter declining to go beyond Yeovil, the Wilts & Somerset was extended from Frome through Yeovil to Weymouth, with branches to Sherborne and Bridport, and its title altered to the Wilts, Somerset & Weymouth Railway.

Meantime the Great Western had carried their attack into the heart of the enemy's country by agreeing to take a lease of the Southampton & Dorchester Railway, an independent local project, vulgarly known as "Castleman's Corkscrew" from its principal promoter Mr. Charles Castleman, and with which the South Western had till too late declined to come to any terms. It was, of course, to be broad-gauge.

The South Western projects were lines from Basing-

stoke to Didcot and through Newbury to Swindon; from a point on their main line some two miles north of Winchester to near Dunbridge on the Bishopstoke & Salisbury Branch—this was known as “the Hook Pit Deviation,” and its object was to shorten the distance from London to Salisbury; from Salisbury to Yeovil; and from Salisbury to Dorchester and Weymouth with a branch to Poole. They also gave support to the Cornwall & Devon Central Railway, a projected narrow-gauge line from Exeter by Okehampton, Launceston, and Bodmin to Truro and Falmouth. A proposed line to fill the gap between Yeovil and Exeter was abandoned for want of subscriptions.

Thus the rival schemes stood for the consideration of the “Five Kings.” On the last day of the year the “Kings” published their judgment in favour of the Great Western and other broad-gauge projects on all points, and against those of the London & South Western.

On this decision being known, the two Companies came to terms, and an agreement was drawn up between them whereby the Great Western, with the assent of the Southampton & Dorchester, gave up their interest in that line to the South Western and pledged themselves not to promote any competing lines from Basingstoke; and the South Western on their part pledged themselves to acquiesce in the decision of the Board of Trade by withdrawing their own projects, all connexion with the Central Cornwall line, and their opposition to the lines sanctioned by the Board; and not to promote any competing lines westward from Salisbury or Dorchester. The words of the Agreement, which was dated 16th January 1845, on this point are:

“As regards the future, the acquiescence of the Companies in the decision [of the Board] is to be shown by each Company pledging themselves not to encourage or promote, directly or indirectly, any future line of railway in opposition to, or tending to divert legitimate traffic from the lines of railway communication for the district as settled by the Report, unless under such a completely altered state of circumstances as would induce the Board of Trade to consider the principles which have guided them in that Report as no longer applicable.

“In order to preserve friendship between the Companies and to avoid unnecessary contention, no step shall be taken by either Company to bring any such line before the public, or in any way, directly or indirectly, to promote or encourage the same, without first applying to the Board of Trade after giving notice of their intention to do so to the other party, and ascertaining that the Board is favourable to such line on public grounds and does not think it inconsistent with the principles of its present decision; and if the opinion of the Board of Trade shall be ascertained to be unfavourable to such line, it shall at once be abandoned.

“In the above agreement reference has been had more especially to extension lines from Salisbury or Dorchester competing with the Great Western (including its branches) and the lines now sanctioned, on the one hand, and to extension lines from Basingstoke competing against the South Western Railway (including its branches) and the Coast Line to Dorchester, on the other.”

This Agreement was confirmed by the Directors of the two Companies, and afterwards approved and ratified by the Shareholders of both at their General Meetings in February.

Hence there was peace in the south during the 1845 Session, and the Broad Gauge Forces were left free to concentrate on the northern front, where they won a notable victory.

The rival schemes being all withdrawn, the Bills incorporating the Berks & Hants and the Wilts, Somerset & Weymouth Railway Companies had an easy passage through Parliament, as also did the Bristol & Exeter Company's Bill authorising their branch to Yeovil. In passing the preamble of the Weymouth Bill,

however, the Lords' Committee, impressed with the need of a direct line between London and the west, exacted a pledge from Counsel for the promoters that the powers given should not be used thereafter to prevent such a line being made. The actual pledge given was : " The promoters of the Wilts, Somerset & Weymouth Railway Company are willing to assure the Committee that the extension of the line to Weymouth shall not be set up hereafter to defeat a direct line from London to Falmouth."

The Southampton & Dorchester Company also got their Act of Incorporation with powers to lease or sell the railway to the South Western, the latter Company taking the place of the Great Western in accordance with the January Agreement. The intended Broad Gauge was of course altered to Narrow, and provision made for laying the latter on the Wilts & Somerset between the junction at Dorchester and Weymouth.

In view of the importance attached by Parliament to a direct line to the west and their pledge to the Lords' Committee, the Great Western Directors instructed Brunel to prepare a scheme for the Session of 1846. In his evidence before the Gauge Commission in the autumn, Saunders tells us that it was always intended that the Wilts & Somerset should form part of a direct line to Exeter, and that the pledge asked for was therefore willingly given. As such a line would necessarily compete with and injure the Bristol & Exeter Railway, the Directors felt it would be only fair to make an arrangement with that Company before taking active measures to promote the direct line. Terms were accordingly arranged in October between the two Boards for the purchase of the smaller line by the Great Western. The

Bristol & Exeter Proprietors, however, rejected the provisional agreement by a considerable majority, so the Great Western, having done their part, proceeded alone with the line. The proposals were to extend the Berks & Hants Railway from Hungerford to Westbury, with branches to Marlborough and Devizes; to straighten the Wilts & Somerset by making the junction between the Salisbury and Weymouth lines at Westbury instead of Upton Scudamore; and to promote a company to make a railway from Yeovil by Crewkerne, Axminster, Honiton, Ottery, and Stoke Canon to Exeter, with a connecting line from Bridport to Axminster and branches to Chard and Sidmouth, to be called the "Exeter Great Western Railway."

No sooner was this scheme made public than the South Western Directors seized on it as a pretext for breaking the Agreement, whereby they had secured the Southampton & Dorchester. For some months the promoters of the narrow-gauge projects west of Salisbury, led by their own Engineer, Joseph Locke, had been urging them to this course. So on the 30th October their Secretary wrote to the Board of Trade alleging that the circumstances under which the Agreement was made had been materially altered by the Great Western proposal, and asking them to receive a deputation to urge that the South Western were now at liberty to promote a new direct line to Exeter by way of Salisbury and Yeovil. In their reply the Board "admit that the numerous schemes which have been advertised for supplying railway accommodation through the districts referred to in the Agreement alter the circumstances in which it was made; but my Lords do not feel called upon to express an opinion whether this alteration of circumstances is

sufficiently extensive to justify a departure from the Agreement by one or other of the two Companies." The Board of Trade having thus declined to assist them with the sanction required by the Agreement, the South Western Directors took the responsibility on themselves and gave notice to the Great Western that "they had come to the conclusion that in the present state of circumstances the London & South Western Railway Company are at liberty to act in such manner as shall seem best for the interests of this Company." Upon this Russell wrote an indignant letter of protest to Chaplin, in which he described the conduct of the South Western as "an unexampled breach of faith"; and a protest was also made by Lord de Mauley, Chairman of the Southampton & Dorchester Company, the third party to the Agreement.

For the 1846 Session the South Western promoted or supported a line from Basingstoke to Salisbury, which they had, of course, a perfect right to do, and also the Salisbury & Yeovil, Exeter, Yeovil & Dorchester, and Cornwall & Devon Central Lines. Of these, the first was passed, the last stopped by Standing Orders, and the remaining two defeated by the Great Western opposition in the House of Lords. On the other hand, the Great Western Bills, opposed by the Bristol & Exeter in addition to the South Western, were thrown out in the Commons. Broad Gauge interests were, however, consoled to some extent by the safe incorporation of the Cornwall and West Cornwall Railway Companies.

The fight was renewed in 1847, the Great Western reproducing the Berks & Hants Extension and the Exeter Great Western Railways, the latter slightly altered to provide a central station in Exeter and to join

the South Devon Railway near St. Thomas, with a fork to the Bristol & Exeter crossing over that line between St. Davids Station and the River Exe, and joining it from the west a short distance north of the station. Branches to Charmouth and Crewkerne were added to those of the year before. They also projected the Compton & Wilton Line to connect Yeovil with Salisbury, from a point on the Weymouth line just north-east of Yeovil to Wilton on the Salisbury branch.

The Bristol & Exeter Company, for their part, again opposed the Exeter Great Western, and promoted a Bill for a line from Durston to Castle Cary on the Wilts, Somerset & Weymouth, which with the Berks & Hants Extension would make a more direct line between London and Exeter than the former.

The South Western this year asked for powers to make a Salisbury & Yeovil line themselves, and supported the Exeter, Yeovil & Dorchester and Cornwall & Devon Central Companies, and also a new project—the Exeter & Cowley Bridge Junction Railway to join the Yeovil line with the Exeter & Crediton Railway, in which they had acquired a controlling interest by the indirect purchase of shares.

After a fifty-three days' fight in Committee the Berks & Hants Extension and the Bristol & Exeter line from Castle Cary to Durston, giving with the intervening portion of the Wilts, Somerset & Weymouth a direct broad-gauge line from London to Exeter, and the Salisbury & Yeovil, and Exeter, Yeovil & Dorchester, giving a similar narrow-gauge line, passed the House of Commons, the Exeter Great Western and the Cornwall & Devon Central projects being once more thrown out, while the Cowley Bridge Junction line was withdrawn. As it was then

too late in the Session for the Lords to proceed with the Bills, the whole of them were suspended till the following year when, after another strenuous fight, the Peers confirmed the decision of the Commons.

Meantime the reaction after the Railway Mania had set in, and from the summer of 1847 onwards it became practically impossible to raise money on reasonable terms for railway enterprises of any kind. Hence no steps were taken to construct any of these lines sanctioned in 1848, and the powers given were eventually allowed to lapse by both sides. A competent witness, Joseph Locke, estimated that the four years' contest had cost between three and four hundred thousand pounds.

The same cause put a stop to the progress of the Wilts, Somerset & Weymouth Railway. As soon as they had got their Act, this Company took active steps to make the line throughout; land was bought and contracts let for the works on nearly all parts of the system. In 1846 a supplementary Act was obtained altering the junction between the Weymouth and Salisbury branches from Upton Scudamore to Westbury, and that of the Devizes Branch from near Melksham to Holt, and authorising short deviations at Thingley, Frome, and near Dorchester, and extensions to the Quays at Weymouth and from Bradford to join the Great Western at Bathampton. This last had been forced on the Company by a clause inserted in their original Act compelling them to apply for and make a better line of communication with Bath and Bristol to the satisfaction of the Board of Trade. An improved line between Frome and Bruton was authorised by another Act in 1847. In this year the Directors' troubles began. Loans were unobtainable; calls were not paid, and as soon as one was made the

value of the shares dropped almost to the full amount of the call. Matters were, of course, made worse by the success of the opposition lines from Basingstoke to Salisbury and Yeovil. Consequently no new contracts were let, and soon arrangements were made with existing contractors to reduce, and later to stop, the works, and with landowners to postpone completion of purchases. The section from Thingley Junction to Westbury, not quite 14 miles, was opened on the 5th September 1848, but the remainder of the 120 miles of authorised railway was marked only by finished or unfinished bridges and earthworks scattered throughout its length, while in many cases the land was left in the hands of its former occupiers or re-let. The short branch from Staverton to Bradford was made and even the Bradford Station built, but for some reason the rails were left unfinished, and no attempt was made to open it. So matters remained for some years to the extreme discontent of the inhabitants.

Early in 1850, as the only hope of doing anything with the line, the Great Western Directors arranged to take it over from the local Company, giving the shareholders 4 per cent. guaranteed stock in lieu of their ordinary shares. As the Great Western had from the beginning guaranteed 4 per cent. on the capital, of which they held £545,000, this was only a paper transaction. The Wilts, Somerset & Weymouth Railway in its very incomplete state was accordingly handed over to the Great Western and became part of their system from the 14th March 1850. The transfer was confirmed by Parliament in the following year, and the Wilts, Somerset & Weymouth Company dissolved.

The Great Western immediately proceeded to extend the line to Frome and Warminster, opening to the

former place on the 7th October 1850, and to the latter on the 9th September 1851. They also began the branch from Frome to Radstock, which was expected to produce a considerable coal traffic, but this was not finished till November 1854 owing to difficulties in getting some of the land. Below Frome the remainder of the land was bought, and negotiations entered into with local people, who thought they could get the necessary capital for finishing the works. The result of these was the floating of the Frome, Yeovil & Weymouth Railway Company, for which an Act was obtained in 1852. As this Act contained a clause that the Agreement with the Great Western should be void unless the whole capital were subscribed within three months, and this was not done, the Company sank at once and the Great Western were left with no alternative but to find the money themselves. This they seem to have been very loth to do, in view probably of their engagements in the north at this period. The fever of the mania having passed, Saunders and Russell foresaw that it would be a long time before these extensive branches through purely agricultural districts would be likely to pay their way. At the same time they did not wish that country to fall into the hands of the South Western, with whom they felt after the experience of 1845 it was hopeless to try to make any binding agreement.

At this time the latter Company was a house divided against itself as regards the policy of western extensions. The branch from Bishopstoke to the Milford Station at Salisbury had been opened on the 1st March 1847, and the Southampton & Dorchester line on the 1st June in the same year, but no steps had been taken towards making the lines westward authorised in 1848; even

between Basingstoke and Salisbury, though nearly all the land had been bought and most of the heavy works executed, the powers obtained in 1846 were allowed to lapse. At this the citizens of Salisbury were very irate, and an independent company was promoted by them and their neighbours to buy the works already made by the South Western and complete the line. This project failed in the Sessions of 1851 and 1852, but being brought in again in the next year was adopted by the South Western Company, who feared its becoming a broad-gauge line in connection with the Great Western Basingstoke Branch, and passed, with a clause suspending the South Western dividends if it was not finished in the time limited. Further progress westward was barred by the factions into which the Company and even the Board were divided. One party led by Locke, now no longer the Company's Engineer but M.P. for Honiton and owner of an estate nearby, was in favour of a central line from Salisbury through Yeovil to Exeter; another, led by Castleman and Captain Moorsom, the Engineer, was for the coast line from Dorchester by Bridport and Axminster; while a third was against all extension and advocated closing the capital account. The majority of the Directors favoured the central line. Bills for both schemes were deposited by independent parties at the end of 1851, and brought before a special meeting of the Shareholders in December. The Board recommended support for the central line, but a committee of shareholders was appointed who reported in favour of encouraging the coast line, and on a poll their report was adopted by a large majority. After this the central scheme collapsed for lack of subscriptions, and the Dorchester & Exeter Coast Extension Railway, to give Captain

Moorsom's line its full title, was rejected on Standing Orders. Again, in the autumn of 1852 the central line was brought by the Directors before special meetings of the Shareholders as worthy of support, and again they refused, though by a smaller majority, to have anything to do with it.

Matters standing thus with their rivals, the Great Western Board determined to make one more effort to capture the country for the Broad Gauge, and announced their intention in their Report to the Half-yearly Meeting held on the 12th August 1852, when their plans were duly sanctioned by the assembled Proprietors. These, as eventually matured for Parliament, were for a joint line with the Bristol & Exeter Company, entitled the Devon & Dorset Railway, from a forked junction at Maiden Newton on the Wilts, Somerset & Weymouth line, through Powerstock, Netherbury, Bettiscombe, and Chardstock to Axminster, and thence by Honiton and Ottery St. Mary to join the Bristol & Exeter at the bridge over the Exe south of Stoke Canon, with branches from Netherbury to Bridport Harbour and from Ottery to Sidmouth.

Now it must be confessed that this line appears to have been a bold and, in view of the non-completion of the Wilts & Somerset, rather barefaced attempt merely to occupy the district to the exclusion of both the rival projects. As a through line to Exeter it had no merits, the distance from London being 203 miles, nearly ten longer than the existing route by Bristol; as a local line it left even Bridport four miles off on a branch. In his evidence before the Commons Committee, Brunel admitted it would be better to take the main line through that town, but stated that his endeavour had been to

give the greatest accommodation to the district consistently with certain rules laid down from a military point of view. He had consulted the military authorities, who gave their opinion that for defence purposes the line should be kept some miles from the coast with branches to the ports. However, the two Companies had a genuine intention of making the line, offering to undertake an obligation under penalties to complete and open it in a limited time.

The Bill came before Parliament early in 1853 and was read a second time. Upon this, the South Western Directors took serious alarm and called a special meeting of their shareholders in May to consider the matter, telling them they must now decide once for all whether they would pledge themselves to make the coast line from Dorchester as advised by their own committee, or allow the whole district to pass into the hands of the Broad Gauge Companies, which, said the Board, would inflict a vital injury on the interests of the Company. At this meeting the Directors were definitely authorised to pledge the Company to apply for powers at the earliest possible period to extend their railway from Dorchester by Bridport and Axminster to Exeter, and to execute such powers forthwith by the creation of the necessary capital by the Company and not by independent parties.

The Committee of the House of Commons began taking evidence on the Devon & Dorset Bill on the 17th June. Petitions against it had been lodged by landowners and occupiers, organised and backed by the South Western Directors, and by "Inhabitants of Wilts, Somerset, and Dorset," who were angry with the Great Western for not proceeding with the long authorised lines in their districts.

Saunders and Brunel were, of course, the chief witnesses for the Bill; they were severely attacked on this very vulnerable point. No representative of the Bristol & Exeter appeared, which suggests that that Company was somewhat half-hearted in the matter. It seems to have been very unpopular with the traders of Exeter, several of whom complained of its extortionate charges for goods, far higher than those of the Great Western and other lines, on account of which they got many things by sea to Torquay and even Plymouth, and thence by the South Devon Railway. The usual local witnesses were produced, a dozen by the promoters and sixteen by the opposition. Mr. Locke urged the claims of the narrow-gauge central line from Salisbury, and Captain Moorsom those of the coast line from Dorchester, both uniting in attacking the Devon & Dorset as being laid out solely for the purpose of occupying the country without consideration for the needs of the public. The Chairman of the South Western, the Hon. Francis Scott, M.P., was examined at great length as to the past proceedings of his Company, and gave the definite pledge, authorised by his shareholders, that if the present Bill were rejected, the London & South Western Company would forthwith apply for powers, provide the capital themselves, and make the Coast Extension Line from Dorchester to Exeter. To ensure the defeat of the Bill, he had secured powerful allies. Lord Palmerston, Home Secretary, the Right Hon. Sidney Herbert, Secretary at War and M.P. for South Wilts, Lord Malmesbury, late Foreign Secretary, Lieut.-General Lord Hardinge, Commander-in-Chief, and Sir James Graham, First Lord of the Admiralty, came to bear witness to the importance for the defence of the country of railway communication without break of

gauge along the whole south coast from Dover to Plymouth. If a break was unavoidable, they would prefer it to be as far west as possible.

In view of the South Western Chairman's pledge that his Company would make a narrow-gauge line forthwith, this evidence decided the fate of the Devon & Dorset Bill, and on the 30th June the Committee announced that the preamble was not proved.

Thus was the Broad Gauge decisively defeated in the South. Neither the Great Western nor the Bristol & Exeter made any further serious assault on the country between Salisbury or Dorchester and Exeter, which was, therefore, abandoned to the Narrow Gauge. The enemy were, however, very loth to reap the reward of their victory. Their subsequent proceedings are best related in the impartial language of the Railway Department of the Board of Trade. In his Report to the Board on the Railway Bills of 1855, Captain Galton wrote :

The proceedings of the House of Commons with respect to the London and South Western Railway Bill also deserve notice.

It will be in the recollection of your Lordships that in 1853 the London and South Western Railway Company opposed a Bill promoted by the Great Western and Bristol and Exeter Railway Companies, for a railway termed "The Devon and Dorset Railway"; and that this Bill was thrown out by the House of Commons, upon a pledge given by the London and South Western Railway Company that they would introduce a Bill in the following Session for a continuation of their line to Exeter.

But, having obtained their object, the London and South Western Railway Company repudiated their pledge. Consequently when the Company brought forward a Bill for other objects in 1855, the House of Commons referred the consideration of the Bill to a Committee of nearly the same Members to whom the Devon and Dorset Railway Bill had been referred in 1853. This Committee inserted clauses into their Bill by which the Company were bound, under the penalty of stoppage of their dividends, to introduce into and use their best endeavours to pass through Parliament a Bill for a narrow gauge line to Exeter.

After this the South Western were of course obliged to proceed to carry out their pledge. In the meantime Locke and his neighbours, disgusted with that Company's behaviour, had floated an independent Salisbury & Yeovil Railway Company with the assistance of Thomas Brassey, the famous contractor, who provided nearly half the necessary capital. They obtained their Act in 1854. This, with other things, turned the South Western scales in favour of the central line to Exeter and against the coast line, to which they were committed by the pledge of 1853. However, as the former was by this time generally admitted to be the better route, the Company had little difficulty in obtaining an Act for their Yeovil & Exeter Extension in the Session of 1856, subject to the stoppage of their dividends if it was not open by the end of 1861. They also agreed to lease and work the Salisbury & Yeovil.

Their line was opened from Basingstoke to Andover on the 1st June 1854, and to Salisbury on the 1st May 1857, ten months later than the Great Western branch from Warminster. The Salisbury & Yeovil reached Gillingham 2nd May 1859, Sherborne 7th May 1860, and was completed to a temporary terminus in the Bristol & Exeter's Hendford Station at Yeovil on the 1st June in the same year. Seven weeks later, on the 19th July, the first narrow-gauge train entered the City of Exeter.

CHAPTER VII

GENERAL PROGRESS, 1847-1854

Hungerford — Basingstoke — Westbury — Banbury — Buckinghamshire Malice—Loss of the Bristol & Exeter—South Devon Railway—South Wales Railway—Gloucester & Dean Forest Railway—Depression—Proposed Amalgamation of Great Western, London & North Western, and London & South Western Railways—Consultation Committee—A Goods Manager—The Shrewsbury Alliance—Paddington Station and Hotel—Testimonial to Russell —“The Picture”—Electric Telegraph—Captain Huish proposes Amalgamation — Opening to Birmingham—Aynho Collision — Paddington New Station—Mixed Gauge at Bristol—Birmingham to Wolverhampton—J. R. McClean—Break of Gauge.

OF the three railways sanctioned by Parliament in 1845 and undertaken by the Great Western Company themselves, namely the Berks & Hants, Oxford & Rugby, and Monmouth & Hereford, the Berks & Hants was the first to be finished. The whole of it was let in one contract, and in August 1847 Brunel reported the works as “all but completed,” adding, as regards the general construction of the western branch, that “the circumstances of its becoming in all probability the main line to the West of England has been attended to,” and that a temporary terminus was being erected at Hungerford, so placed as not to interfere with the projected extension to Westbury.

This western section was opened for passenger traffic from Reading to Hungerford, $25\frac{1}{2}$ miles, on the 21st December 1847, with intermediate stations at Theale,

Aldermaston, Woolhampton,¹ Thatcham, Newbury, and Kintbury; accommodation for goods was not ready till a year later. There were no works of any note on the line, save perhaps one high brick bridge of three arches near Reading, carrying the main Bath Road over a deep cutting; the numerous bridges over the canal and streams in the Kennet Valley were mostly, if not all, of timber.

The completion of the southern portion to Basingstoke was delayed by the necessary negotiations with the hostile London & South Western Company as to the terminus and method of communication—of course no junction was possible—with their station close by. These were eventually settled, and the $13\frac{1}{2}$ miles from the junction at Southcot, not quite two miles from Reading Station, opened on the 1st November 1848, with one intermediate station at Mortimer.

Two months before this, on the 5th September, the Wilts, Somerset & Weymouth Company had opened the first section of their line, and the only one they ever completed, from the junction with the Great Western at Thingley, two miles west of Chippenham, to Westbury, with stations at Melksham and Trowbridge, adding $13\frac{3}{4}$ miles to the Great Western system.

The Oxford & Rugby Line was let in one contract in the autumn of 1845 to a “contractor of experience and responsibility,” but there was much delay in getting possession of the land. However, by the next August the works were in progress on nearly the whole of the line to Fenny Compton, at which point, it seems, the Directors had already determined to stop. A year later we find the experienced contractor had not been proceeding at all

¹ Renamed Midgham in 1873.

satisfactorily, and arrangements were being made to take the work out of his hands. This entailed an entire suspension till April 1848, when new contractors began operations. For financial reasons they were instructed to go slow and confine themselves mainly to necessary works such as public road and river bridges and culverts, and the rate of progress remained very limited till August 1849. By this time it had been definitely decided not to proceed farther than the point of junction with the Birmingham & Oxford Railway, two miles beyond Fenny Compton, and to abandon the remaining $15\frac{1}{2}$ miles to Rugby on which no work had been done.

It was also decided to open a single line to Banbury in the first instance, and, as there was no prospect of connection with any narrow-gauge line, to make this broad-gauge only, notwithstanding the Board of Trade order for Mixed Gauge on the Oxford & Rugby Railway. In April 1850 Saunders therefore wrote to the Railway Commissioners requesting their acquiescence in the postponement for the time of the addition of the useless third rail on such single line. The timid Commissioners thereupon sent a copy of his letter to the Buckinghamshire Company, in other words the London & North Western, requesting "any observations they may have to offer on the subject."

This led to another display of bad temper on the part of that Company, or perhaps we should say of Captain Mark Huish. That warrior's promising young subaltern, Edward Watkin, in his capacity of Secretary of the Buckinghamshire Railway Company, which, by the way, was probably his very first railway office, wrote from Euston requesting to be informed whether it was a fact that the Commissioners had, as he understood,

ordered "the national or 4 feet 8½ inch gauge" to be laid down on the whole of the Oxford & Rugby Railway. On the Commissioners replying that such an order had been issued by their predecessors, the Board of Trade, he curtly replied that that being so his Directors considered it unnecessary to state their objections to the proposal of the Great Western Company; adding that, on hearing of the proposed opening of the latter's line, they applied to them to arrange for a narrow-gauge connection at Banbury. It need hardly be said that they had no intention of using any such connection, which could have been of no possible benefit to them.

Meanwhile Captain Simmons reported to the Commissioners that, considering there was no narrow-gauge railway communicating with this portion of the Oxford & Rugby, he did not consider the interests of the public would be injuriously affected by its opening on the Broad Gauge only, provided the Great Western Company undertook to lay the Narrow when the line was extended northward. He added:

The Buckinghamshire Railway is now nearly ready for opening,¹ having been inspected from Bletchley to Banbury; but although it approaches very near to the Oxford & Rugby line, it does not join it, and if it did so, the route would be very circuitous; and moreover, the more direct line from Oxford to Bletchley on the narrow gauge is in course of construction, joining the former at Claydon, which will obviate the immediate necessity for the narrow gauge being laid on this portion of the Oxford & Rugby Railway.

On this, the Commissioners plucked up courage and wrote to Saunders on the 16th May that they had no

¹ It was opened to Banbury on the 1st May; from Claydon to "Oxford Road," 3½ miles from Oxford, on the 2nd December 1850; and to Oxford on the 20th May 1851.

objection to the proposed opening, provided his Company would undertake to add the third rail when required by them and before any extension northward from Banbury. The undertaking was given, and there matters rested for some two months till rumours of what had occurred reached the North Western Manager. The 24th July brought a truculent letter from Euston, this time signed by Sir Harry Verney, Bart., M.P., Chairman of the Buckinghamshire Company, desiring to be informed forthwith whether the Railway Commissioners had indeed given their permission for "not merely an illegal act, but the evasion of the precautions for the advantage and security of the public which Parliament had enacted"! The Commissioners replied with an apologetic explanation of all that had passed, emphasising the temporary nature of the arrangement and even offering to reconsider it. To this Sir Harry rejoined that he regretted to learn they had authorised a violation of the Oxford & Rugby Act, and must ask them to recall such authority. Thoroughly cowed by this bullying—Captain Huish evidently knew how to deal with them—they then sent copies of the correspondence to the Great Western, saying that in view of the Buckinghamshire's objections they must reconsider their position, and suggesting the Company should communicate with the latter for the purpose of removing these objections. Needless to say, the Great Western Directors did not attempt any such obviously hopeless task. What they did do was to take Counsel's opinion and, having obtained it, to reply on the 21st August that they were advised that the Company had "full power, in perfect consistency with the provisions of the Act, to open the line between Oxford and Banbury with rails of the same

gauge as the Great Western Railway, without having previously laid upon that portion any rails of the narrow gauge"; and that the Railway Commissioners had no legal authority to postpone the opening of a railway on any other ground than a report from their Inspecting Officer that such opening would, in his opinion, "be attended with danger to the public using the same." In the same letter, Saunders gave notice that the line would be ready for inspection on the 27th August, and expressed his Directors' intention of opening it at the end of the statutory ten days. The Commissioners answered that they would refer the matter to the Law Officers of the Crown, and meantime withdrew the consent they had given in May but directed Captain Simmons to inspect the line in accordance with the notice.

Having inspected it, that officer reported that he was not aware of anything affecting the safety of the public to prevent its opening for traffic, so long as the single line was worked, as proposed by the Company, by one engine only. In forwarding his report to Saunders, the Commissioners, while admitting that they were advised they had no power to postpone the opening, stated that they could not approve of it in the absence of a narrow-gauge rail, and so the Company must act upon their own responsibility. Under the circumstances, they *trusted* the Company would defer the opening until the third rail had been added, but should they not do so, its addition should be made with all reasonable dispatch; if not made by the end of four months, "the Commissioners will take such steps as may be necessary to protect the public interests and to enforce the provisions of the Act"'. Though the rail was not added for more than two years they never attempted to carry out this dreadful threat.

With undaunted courage the Great Western Directors opened their broad-gauge single line between Oxford and Banbury on Monday, the 2nd September 1850. It was $24\frac{1}{4}$ miles long from its commencement at the point named Millstream Junction,¹ on the Oxford Branch, three-quarters of a mile south of the terminus and near the Abingdon Road Bridge. Captain Simmons wrote in his report :

The works upon it are not of a heavy character. One bridge over the River Isis near Oxford, consisting of three openings, is constructed of wrought iron. The railway is carried by three beams, one in the centre and two others on each side, each beam being continuous over the three openings, the centre opening being 62 feet, and the two end ones 32 feet. The other bridges carrying the railway are principally of timber framed, and some are of cast iron. They appear to be of ample dimensions and strength to perform the duties required of them.

Though only a single line of rails was laid, the works were all completed for a double line. There were only three intermediate stations, Woodstock Road, Heyford, and Aynho,² and trains from and to Oxford of course had to reverse at Millstream Junction.

Three days after the opening another outburst from Euston Square reached Whitehall, signed by Sir Harry Verney, protesting against "the whole course of the Commissioners of Railways in the matter"; urging "that they forthwith order and direct the Great Western Com-

¹ This was where the 62 mile post now stands, near the southern extremity of the reservoir, which was originally (1844-48), a Great Western ballast pit.

² A new Woodstock Road, 2 miles nearer Oxford, was opened in 1855, the old one being then renamed Kirtlington. In 1890 the former became Kidlington and the latter Bletchington. Somerton was opened in 1855, and King's Sutton in 1872.

pany not to open but to postpone the opening of the portion of the Oxford & Rugby Railway extending from Oxford to Banbury"; and stating the opinion of the Buckinghamshire Company "that for the Inspector to report as complete, or fit for opening, or free from danger to the public, a railway which is upon a totally different gauge to that required by the Act under which it is constructed, and which cannot by possibility be traversed safely by narrow gauge engines, would be indeed a most extraordinary proceeding." This effusion seems to have roused the Commissioners to some small sense of self-respect, for they replied curtly that having already informed the Buckinghamshire Company of their views as to the opening and the course they meant to pursue, they "are not aware that they can give any fuller explanation of their intentions."

Young Watkin returned to the attack in January 1851, but after patiently replying to several of his distinctly insolent letters the Commissioners at last had the spirit to inform him in April that "after a full consideration of all the circumstances, they do not deem it expedient at present to take any further steps to protect the public interest or to enforce the provisions of the Act." Even this snub did not quite choke him off, but the Commissioners stuck to their guns and Captain Huish's spiteful attempt to cause the Great Western useless expense was baffled.

The third Great Western line of 1845, the Monmouth & Hereford, never materialised. After the Act for the Gloucester & Dean Forest Railway to connect it with Gloucester was passed in the next year, it was set out, some land bought, and contracts advertised but not let, save one for shafts and headings of the tunnels. Work on

this was soon stopped, and after 1847 we hear no more of the line, though £59,000 had been spent on it. Four years later the main portion between Westbury-on-Severn and Hereford was revived in a slightly altered form by a local company, under the title of the Hereford, Ross & Gloucester Railway.

The Bristol & Exeter Company opened a branch to Clevedon on the 28th July 1847, and another to Tiverton on the 12th June 1848, thereby adding $3\frac{1}{2}$ and $4\frac{3}{4}$ miles respectively to the Great Western system; but, the lease of that railway coming to an end on the 30th April 1849, the total mileage worked by the Great Western was reduced from 312 to 227 on the 1st May.

From this time onwards for twenty-seven years the Bristol & Exeter Railway was totally distinct from the Great Western, with its own staff, engines, and rolling stock. Trains between Paddington and the west of course continued to run through, but were worked by Bristol & Exeter engines over that line and made up of both Companies' stock. The Companies themselves were quite independent of each other, not having even one Director in common.

Beyond Exeter the South Devon Company opened its main line to Teignmouth on the 30th May 1846, to Newton on the 30th December, to Totnes on the 20th July 1847, to Laira Green, some two miles short of Plymouth, on the 5th May 1848, and into Plymouth on the 2nd April 1849; and its branch from Newton to Torre Station, Torquay, on the 18th December 1848. It also had its own staff and rolling stock, but hired engines from the Great Western till the end of June 1851 and afterwards from contractors for fifteen years. It cannot, however, be said to have been really independent, as eleven Directors

out of its original Board of twenty-one were nominated by other Companies who had subscribed capital; four by the Great Western, five by the Bristol & Exeter, and two by the Bristol & Gloucester or their successors, the Midland. In 1849 these were reduced to two, three, and one respectively, but as the whole Board was at the same time reduced to eleven, the nominated Directors still formed a majority.

After a year's interval the engines and stock rendered superfluous by the loss of the Bristol & Exeter came into use on the South Wales Railway, which the Great Western had undertaken to work, as far at least as the Locomotive and Carriage Department was concerned, the rest of the staff being employed by the South Wales Company itself. The first section, from Chepstow to Swansea, 75 miles long, was opened for traffic on the 18th June 1850. This remained isolated for two years, till the 19th July 1852, when a single line was completed over the Wye Bridge, uniting it with the portion between the east side of that river and Grange Court, which had been opened, together with the Gloucester & Dean Forest Railway between Grange Court and the Great Western at Gloucester, on the 19th September 1851.

This opening of the through connection with the Great Western brought a so-called lease of the South Wales Railway into force, under which the line was managed by a joint committee of five Directors of each Company, the lessees providing power and rolling stock, and the lessors accommodation for the traffic. After being paid their part of the working expenses, the Great Western received one-third of the net profits in return for a fixed rent. This curious arrangement was the cause of endless disputes and trouble between the two Companies, as to

which more will be said later in the story of the South Wales Railway.

The Gloucester & Dean Forest Railway of 1846 was, as we have seen, a line to connect the Great Western at Gloucester with the Monmouth & Hereford in Westbury-on-Severn and the South Wales at Hagloe Farm beyond Awre. Both the Great Western and South Wales Companies agreed to subscribe towards its capital, but



GLOUCESTER STATION, 1852

the latter, in lieu of doing so, soon afterwards arranged to take over the seven miles between Hagloe and Grange Court, where the Monmouth & Hereford was to join, and make them part of their own Railway, leaving the Gloucester Company only seven and a half miles to construct. These were begun early in 1847, but the hard times soon caused suspension of the works and very little was done for nearly two years.

The bridge at Over was reported as completed in August 1850, but that nearer Gloucester over the other

branch of the Severn was not ready for another year. Although navigation on this branch was effectually stopped by the old stone bridge below, the Company was obliged by its Act to make an opening bridge to provide for the possibility of the road bridge being altered ! Brunel accordingly designed a skew bridge of three wrought-iron girders, 125 feet long, to cover two openings of 50 feet each on the square, capable of turning on a central pier formed of five cast-iron columns filled with concrete. The construction of this bridge and the arrangements for the junction with the new Great Western Station both delayed the opening of the line, which eventually took place on the 19th September 1851, together with that of the eastern section of the South Wales Railway to a temporary terminus on the east bank of the Wye.

The new Great Western Station at Gloucester was not fully completed until the autumn of the following year. It was another one-sided station on the south of the railway, but differed from those at Reading and Slough by consisting of one long continuous platform instead of two separate Up and Down stations.¹

The Gloucester & Dean Forest Railway was leased to the Great Western from its opening in perpetuity at a rent of $4\frac{1}{2}$ per cent. on its capital, to be raised to $5\frac{1}{2}$ on the opening of the railway to Hereford, which occurred in 1855 ; so this little Company did exceptionally well for itself. It maintained a nominal existence till 1875, when it was finally absorbed.

Besides the main line, this Company began the construction of a branch from Over to the Docks at Gloucester,

¹ It remained one-sided till 1885, when the new Up platform was built.

for which it obtained powers in 1847, but its funds being exhausted, the Great Western was left to finish the branch, which was opened for goods traffic on the 20th March 1854. There was another opening bridge of 70 feet span for a single line on this branch.

The effects of the reaction, which was bound to follow the mania of 1845-6 when the money had to be found for the many costly projects authorised in those years, began to affect the Great Western in the first half of 1847.

At the August Meeting the Directors announced that owing to the state of the money market, they intended to delay the construction of new works and spread it over as long a time as possible "until some decided change shall have taken place in the aspect of the monetary affairs of the country." They were, however, obliged to ask for authority to raise money to meet the subscriptions promised to other Companies, and proposed to do this by the issue of guaranteed securities rather than new shares. The authority was given them, to be exercised at their discretion as to time and manner.

To make matters worse, a deep depression of trade set in, and at the next General Meeting, "influenced by the fact of an unusual stagnation in traffic perceptible during the last few weeks on this as on all other railways in England," they recommended that the dividend for the second half of 1847 should be reduced from the steady 8 per cent. per annum of the last three years to 7, and a larger balance than usual be carried forward. Three-quarters of a century were destined to pass before the Company again paid 8 per cent.

All this time the value of the Company's shares was going down and down. By July 1848 the £100 shares,

regarded as fully paid,¹ had fallen in twelve months from 146 to 95, and the other shares of course in proportion. The Great Western fared no worse than most other Companies in this respect; London & North Western fell from 184 to 120 in the same period.

In view of this serious state of affairs, deputations of the Boards of the London & North Western, Great Western, and London & South Western Companies met in September 1848 in order "to adopt, as well for the sake of the Public as of the Proprietors, some immediate and efficacious measure for counteracting the prejudicial effect on the commercial and manufacturing interests (as affirmed by Committees of both House of Parliament), and the serious depreciation of Investments in Railways, occasioned by the unprecedented demand for additional capital to be employed in constructing simultaneously many new lines of railway not immediately or imperatively required." After several conferences they finally resolved on the 1st November that the most effectual plan would be an absolute and permanent amalgamation of the three Companies under the sanction of Parliament, and settled the preliminary arrangements for such amalgamation, including the immediate appointment of a Joint Board of seven Directors of each Company to promote the necessary Bill and meantime to control all expenditure. Their conclusions were announced to the shareholders and a Special Meeting of each Company convened for the 13th December to consider them; but ten days before that another circular informed those of the Great Western that the North Western Directors had proposed an alteration in the terms, which was

¹ They were not so in fact till January 1849, when the last call of £10 fell due.

considered inadmissable by the two other Companies, and so had abandoned their Meeting; wherefore the Great Western Meeting would not be held. The North Western Directors were not content with an equal number of representatives of their Company on the United Board, and so this sensational amalgamation scheme was nipped in the bud.

Economy then became the order of the day, but in spite of the Directors' efforts and owing to the interest on additional capital, the dividend fell first to 6 per cent. per annum in February 1849, and then to 4 in August. On the latter occasion the two Auditors suggested, in a report on the published Accounts, the appointment of two or three shareholders to confer with the Directors as to the future outlay of capital and general reduction of expenditure. This suggestion, which was evidently made with the connivance of the Directors, was "cheerfully acquiesced in" by them, and they went so far as to offer that four of themselves should retire to make room for new Directors to be elected by the shareholders. Having cleared the ground by rescinding the old rule of the Company that at least four Directors must reside within 20 miles of London and four within 20 miles of Bristol, the August Meeting left the election of new Directors and of the committee of consultation to a Special Meeting to be held in September in London. At the Special Meeting a committee of four shareholders was appointed, and four new Directors were elected in place of the same number retiring, three of whom had been in office since the foundation of the Company.

The Committee of Consultation spent the autumn in a searching investigation of the Company's affairs, and in visiting all the fifty-two stations and goods depots on

the system. At the end of January 1850 they produced a report, which was printed and sent to the Shareholders with the Half-yearly Accounts. It contained nothing very startling or new as to capital outlay and liabilities, the total of which they estimated at £17,300,000. They strongly recommended the completion of the northern line to Birmingham, Wolverhampton, and Dudley, but thought the Wilts & Somerset should not for the present be extended beyond Frome and Warminster. They had nothing but praise for the general administration and management of the different departments of the Company's business, beyond remarking that they did not think "that sufficient means have been taken to bring Goods Traffic to the Line," and making a few suggestions as to details such as the provision of cottages at level crossings, "which will save the expense of night watchmen," their idea evidently being that the wretched day watchman might then be called out of bed at any hour without being paid for it.

Their main recommendation for effecting economy was a general reduction of salaries, beginning from the top. Russell and most of the Directors strongly opposed this, but the Committee produced accounts of the salaries paid by other Companies, which seem to have had some effect, and a letter from Saunders, whose devotion to the Great Western far exceeded his self-interest, acquiescing in their proposal that his own salary should be reduced, disarmed the opposition and induced the Board, against their will, to agree to general reductions. "With respect to the lower class of clerks, rather than recommend a reduction of their salaries, your Committee have suggested more activity on their part as a means of lessening their numbers." As regarded the Police and Porters, the

Committee “considered the scale of periodical increase too great, particularly as they were clothed from head to foot at the expense of the Company.” They concluded by suggesting a reduction of the number of Directors and recommending that a quarter of the Board should retire annually and be ineligible for re-election for a year.

The Half-yearly Meeting in February passed a resolution recommending that the various propositions contained in the Committee’s Report “be considered by the Directors, to report their opinion thereon, with reasons, in case they do not carry them out, to be submitted to the decision of the next General Meeting of the Company.”

Two Special Meetings were held in April, one to raise £3,500,000 by the issue of 4½ per cent. Guaranteed Stock, to provide for the purchase and completion of the Birmingham & Oxford and Birmingham, Wolverhampton & Dudley Railways, and the discharge of some existing loans; the other to consider the Board’s reply to the Committee’s Report.

With most of the Committee’s suggestions the Directors heartily agreed; indeed, many of them had been adopted in advance. They had little difficulty in satisfying the assembled Proprietors that to reduce their own number below twelve, or to make an efficient Director with his intimate knowledge of the Company’s affairs ineligible for re-election for even a year, would be distinctly prejudicial to the Company’s interests.

As to the question of salaries and wages, they stated that, having already made a considerable reduction in the number and thereby increased the duties and responsibility of the staff, they were very reluctant to make any reduction in the payment of “those who had undertaken such increased duties and had proved themselves to be

faithful and valuable servants"; and had only yielded at length by way of experiment to the opinion of the Committee nominated by the Proprietors, thereby proving that they were not influenced by any personal feelings.

It is with much regret the Board feels bound by its duty to the Proprietors to represent that the short experience of a few months has realized their apprehensions. Since the reduction was notified the whole establishment has become unsettled; the Officers and principal Clerks, with few exceptions, have been seeking other employment; some valuable servants have quitted and others are about to leave the service. Nor has the effect of the reduction been confined to those whose salaries were reduced, for several others, in despair of improving their position in the present service, have also resigned to obtain more lucrative employment elsewhere.

The Directors have thus had practical proof that serious prejudice to the Company has arisen, and they apprehend that still more must ensue, unless steps be now taken to give some assurance of an established scale of salary and pay, upon which your officers and servants can rely. If length of service with great experience and proved ability are essentials in managing affairs towards the prosperity and welfare of any important undertaking, success is not likely to be attained by the discouragement of those upon whom so much depends, nor can a reduction of reasonable salaries be expected to counteract pecuniary depression in times of difficulty.

The Board then recommended the adoption of a new scale of salaries and wages, which was eventually adopted by a 20 to 1 majority on a poll at another Special Meeting in May, and, generally speaking, remained in force for many years.

A new office, hitherto unknown on the Great Western, was created about this time, the Directors announcing in August that it had been thought desirable to engage the services of a gentleman in the capacity of a Goods Manager. For this post they had selected Mr. A. J. Drewe, "who has had long experience in the Carrying

Trade of the West of England." For some years the receipts from goods traffic had generally been about a third of those from passengers and parcels; for example, in the half-year to 30th June 1850 they were £99,850 as against £295,100.

In financial matters an important change was the conversion, as from the 1st July, of the various denominations of shares into "Consolidated Great Western Railway Stock."

Towards the end of the year Saunders was approached by representatives of the Shrewsbury & Birmingham and Shrewsbury & Chester Railways, two little Companies engaged in a bitter and unequal fight with the London & North Western for some share of the traffic between the midlands and Liverpool and Manchester. Driven to look for outside help, they naturally applied to the only Company in a position to help them by means of its access to Wolverhampton from the south, now about to be constructed. The Great Western Secretary at once saw the prospect, not only of much additional traffic on the costly Wolverhampton line, but also of extending the Broad Gauge to the Mersey, originally proposed by Captain Huish himself in 1845. It so happened that negotiations with the North Western, which had been going on for nearly two years, for saving capital expenditure to both Companies by a common station in Birmingham and a joint line thence to Wolverhampton, as well as a joint piece of line through Leamington, had come to an end; so the Great Western was free from any obligations to them. The story of the two Shrewsbury Companies is told in the next chapter; here it will suffice to say that a traffic agreement with them was settled and finally sealed on the 10th January 1851, and followed on the

8th May by an agreement for their future amalgamation with the Great Western.

This prospective addition to the system came at a time when trouble with the Oxford, Worcester & Wolverhampton Company, which had been brewing since the autumn of 1848, came to a head and brought about the secession of that railway from the Broad Gauge family. How this trouble arose through the foolish conduct of the Oxford, Worcester & Wolverhampton Board, and how it developed into open hostility, is told elsewhere. In 1851 the Oxford, Worcester & Wolverhampton, which the Great Western had helped to create, became and remained for ten years an entirely foreign and bitterly hostile company, notwithstanding the fact that the Great Western held nearly £200,000 of its capital and appointed six Directors to its Board.

In anticipation of the opening of the Birmingham line and of through communication with South Wales, the question of additional accommodation at Paddington became pressing in 1850. For twelve years the increasing traffic had been carried on as best it might in the temporary station west of Bishops Road Bridge, to which only a few trifling additions had been made since its opening. Having come to the conclusion that any further additions would be neither effective nor economical, the Directors proposed at the February Meeting of 1851 to build "a Passenger Departure Shed, with Offices, Platforms, etc., and proper approaches on the ground beyond the present Goods Shed," which was just east of the Bridge, and also a new "Merchandise Building" north of the existing station to take the place of this goods shed, which would have to be cleared away. This partial commencement of the permanent station was

estimated to cost £50,000. Nothing was said at this time about an "Arrival Shed," the idea being to use the existing station for arrivals, as soon as the new departure platforms could be got ready.

At this same Meeting the Board were authorised, "to agree for building on the Company's property an Hotel with Refreshment Rooms, Dormitories, Stables, and other conveniences adjoining the Paddington Station, and to procure the money, not exceeding £50,000, requisite for the purpose, either by Lease or Mortgage of the premises or upon the credit of their undertaking, and to let the premises on lease when built." A clause giving the needful power to build an hotel was included in the Company's Act of the ensuing session.

A year later the Directors came for £75,000 more, for general offices, goods warehouses, grain stores, goods offices, cattle and mileage depots, and a new engine house, as well as the additional land required. Brunel reported at this time that it had been found impracticable to get ready for use even a portion of the new Down platform, as had been intended, until the old goods shed had been removed, and that therefore the whole work depended on the completion of the new one, which was making good progress. Only a portion of it, however, had been finished after the lapse of another year, but enough to allow of the removal of much of the old shed and the consequent resumption of work on the Departure station and offices, which had been unavoidably suspended for want of room. The Directors had by this time, February 1853, decided to get on with the permanent "Passenger Arrival Shed and Platforms," and so asked for and got another £75,000 for these and general purposes at the new station.

Other matters calling for notice in 1851 were: (1) The incorporation of the Hereford, Ross & Gloucester Railway Company, a local company assisted by the Great Western through the Gloucester & Dean Forest Company with a subscription of £25,000 to its capital of £275,000, formed to make a broad-gauge railway from the Gloucester & Dean Forest at Grange Court in Westbury-on-Severn, much on the line of the abandoned Monmouth & Hereford of 1845, to a junction with the Shrewsbury & Hereford Railway in the City of Hereford; and (2) the acquisition by the Great Western of the Kennet & Avon Canal as from the 1st July.

The Great Exhibition of this year brought much additional traffic, and enabled the Company to add a modest ten shillings to the now usual dividend of £4 per cent. It is pleasant to note that "a gratuity was given to the Local Superintendents, Clerks, and other Servants of the Company as a reward for their greatly increased labors, and very meritorious conduct in carrying on the extra business of the season."

The Great Western staff, from the highest to the lowest, were evidently a very loyal family in those days. This is shown by the following extract from the *Railway Times* of 10th January 1852:

Great Western.—At a meeting of the officers and servants of this Company, held last week at the Swindon Station, Mr. Gooch, Locomotive Superintendent, in the Chair, it was stated that 1,900 officers, clerks, and servants in the employment of the Company had united in subscribing £420 for the purpose of obtaining a full-length portrait of Mr. C. Russell, the Chairman of the Company, to be placed in the Board Room of the Paddington Station, as a testimonial of their grateful esteem for the high principles of honour, impartiality, and undeviating kindness he has ever displayed towards them; and also to record their sense of the eminent services rendered by him to the Company,

over which he has so long and efficiently presided. Resolutions were passed appointing a Committee to carry out the object of the meeting.

The Committee accordingly waited on Russell soon afterwards and presented him with an address, which, after assuring him that he had "endeared himself to every individual of the establishment," requested him to give sittings for a full-length portrait to some eminent painter, with a view to its being preserved in the new Board Room. Russell replied with a speech of deep feeling, in the course of which he said: "I never have lost and I never can lose any opportunity of expressing my conviction that no public body was ever more ably, zealously, and honourably served than the Great Western."

Francis Grant, R.A.,¹ was the eminent painter chosen, and the portrait dominates the Board Room to-day, as it did in the 'fifties and 'sixties, when appearing before the Directors at an inquiry, whether as culprit or witness, was commonly called by the staff "Going to see the Picture."

Of course in those days when every man in the service had been appointed after a personal interview and all delinquencies were investigated by the Board or a Committee, the Chairman came into much closer contact with the comparatively small staff than he has ever done since such matters were necessarily delegated to the officers.

Russell's reply at the Great Western General Meeting of February 1852 to the North Western Chairman's charge of aggression is worth recording.²

¹ P.R.A. 1866-78. Knighted 1866.

² *Railway Times*, 14th February 1852.

“ I am far from denying that it is natural that the London & North Western should regard with feelings of uneasiness and dissatisfaction our approach towards the north ; but they should not altogether forget that these results are the consummation of a policy which they themselves thought fit to pursue towards us. It was not to injure them, it was to defend ourselves against aggressions from the north and the south that we—how reluctantly those about me best know—were compelled to push forward our advanced posts to Birmingham and Wolverhampton, and make alliances with northern companies. I will not prefer one word that I am not capable of proving by written documents. At our early stages we were most desirous to make amicable arrangements with the London & North Western, if we could only secure to ourselves the position we had actually obtained.”

Later, in reply to a shareholder, he was more explicit :

The Chairman was extremely sorry to say that no arrangement had been come to with the London & North Western ; and proceeded to defend the policy of the Company with regard to the northern lines, and briefly adverted to the early opposition which the Great Western had experienced from the old London & Birmingham, who embarked in a project for a line from Tring to Cheltenham ; to the Birmingham & Oxford line, which was promoted by the Grand Junction in opposition to the London & Birmingham ; and stated that it was not until after repeated overtures from the former corporation that the Great Western consented to connect itself with the scheme ; that the Shrewsbury & Birmingham line was projected by the London & Birmingham as an antagonistic one to the Grand Junction ; and that they (the Great Western Directors) had offered to take one third of the Birmingham traffic and give two thirds to the London & North Western, and had done everything in their power to bring about a friendly settlement of the differences between themselves and that Company. The hon. gentleman also reminded the proprietors of the line promoted by the London & Birmingham, in conjunction with the South Western, to bring down a northern line through Oxford to run parallel to the Didcot branch, as far as Newbury, so as to intersect the whole Great Western district from north to south. He had done all in his power to forewarn Mr. Glyn of the consequences of such an attack, and it was too much now to find fault with Great Western policy because they did not remain defenceless on their own ground but were driven to push forward their posts, as a security to their own traffic, in which they have happily succeeded. It would thus be seen that

the aggression had clearly been upon the Great Western. He would ask, therefore, whether they were to stand with their hands behind their backs whilst repeated encroachments were made upon their traffic. It had been impossible for them to do otherwise than they had done. They would have been guilty of the greatest disregard to the interests of the shareholders if they had not taken the course they had adopted—if they had not advanced upon the enemy instead of letting him come among them. The honourable proprietor seemed to be frightened of a contest. He begged him to have no such fears.

At this same Meeting an agreement with the Electric Telegraph Company was announced. That Company were to lay and maintain wires on the Great Western lines, charging an annual rent for their use, and giving the Railway Company an option to purchase. The Bristol & Exeter Company having made a similar agreement and the telegraph being already in use on the South Devon, its completion between London and Plymouth was thus ensured. The wires were already up as far as Reading; they reached Bristol in May, Bridgwater in July, and were completed to Exeter in August. By the end of the year they extended from Swindon to Gloucester and throughout the South Wales Railway, and from this time their progress was rapid over the remainder of the Great Western system.

The Birmingham & Oxford Railway being nearly finished and all Captain Huish's desperate efforts to break the alliance between the Great Western and the two Shrewsbury Companies having failed, that warrior decided to try to capture the Great Western itself for his "Euston Empire," which already embraced the Midland, Lancashire & Yorkshire, and Manchester, Sheffield & Lincolnshire, besides sundry smaller railways. From being, as Secretary and Manager of the Grand Junction, a strong opponent of monopoly, at any rate when in the

hands of the London & Birmingham, he had become since his instalment at Euston its fierce upholder, and had striven by every means, lawful or unlawful, to block all competition. His methods were quite unscrupulous—to crush small opponents by ruinous rate-cutting; to upset sealed agreements on legal quibbles; to make secret treaties which, when disclosed, turned out to be *ultra vires*; to make “pools” for certain towns and then evade the “pooling” by some rebooking dodge; and even to use physical force against the servants of competing Companies and physical obstacles against their trains at junctions. Examples of most of these methods will be found in the story of his dealings with the two little Shrewsbury Companies told in the next chapter.¹

The Great Western being too independent and powerful for such treatment, absolute amalgamation of the two great Companies, on the basis of North Western Ordinary Stock being worth £100 and Great Western £80,² was proposed in a letter to Russell dated 4th August 1852 from George Carr Glyn, the North Western Chairman, as the only means of putting an end to the strife between them.

The terms suggested appear in the main reasonable, but they involved the recognition by the Great Western of so-called agreements made by the North Western with certain shareholders of the two Shrewsbury Companies as of equal validity with their own agreements properly sealed and sanctioned by General Meetings of those Companies. Hence, if the amalgamation should be

¹ See also Grinling's *History of the Great Northern Railway*, Methuen, 1898.

² The current prices were: London & North Western 132, Great Western 103.

ultimately rejected by Parliament or the North Western shareholders, as was extremely likely, an important step would have been made towards breaking the Shrewsbury Alliance.

After consultation with his Board, Russell replied on the 10th August that they were convinced that Parliament would never consent to the creation of such a vast monopoly, whatever it might have done to save the expenditure of capital in the financial stress of 1849; and that they could not therefore imperil their application to Parliament to carry out their contract with the Shrewsbury Companies, which had already been passed by the House of Commons and only defeated by the Wharnccliffe Order of the Lords, by committing themselves to any such recognition. While equally anxious to put an end to the costly strife between the Companies, they did not agree that amalgamation was the only means of doing so, and proposed instead an agreement for equal fares and rates at competing points, with, if desired by the North Western, a fixed apportionment of the net receipts therefrom.

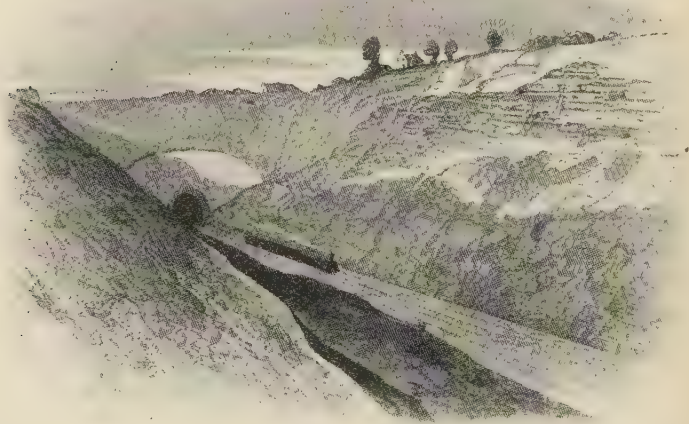
This proposal was at once curtly rejected—the rejection is dated 12th August—and the anger felt at Euston at the failure of what may quite probably, in view of his general conduct, have been intended as a trap by the astute and unscrupulous Captain Huish, was betrayed at the North Western General Meeting next day, when the Chairman actually suggested in so many words that, if their Directors would not carry out the amalgamation, the Great Western shareholders should take matters into their own hands. He also made some disparaging remarks as to the value and security of Great Western stock, which Russell felt obliged to contradict in a

subsequent letter, at the same time strongly deprecating his attempt to create internal dissensions in another Company.

That the Great Western Board were absolutely right in their forecast of the policy of Parliament is shown by the adoption of the Report of the Cardwell Committee in 1853, condemning railway amalgamations save in special cases, and the consequent collapse of the agreed union of the London & North Western and Midland Companies.

The works of the Birmingham & Oxford Junction Railway, now nearly finished, were begun early in 1847 by Messrs. Peto & Betts, the well-known contractors. Financial stringency soon caused them to be delayed, and very little was done for nearly two years. In August 1849 Brunel reported that though progress was still very slow, the viaduct into Birmingham had been finished, and thence as far as Warwick the whole line was in a forward state; the deep Harbury Cutting was also well advanced. Between Leamington and Warwick nothing had yet been done. The original line of 1846 was laid out to pass west of Leamington, but two years later the Great Western obtained power to deviate this from Whitnash through the town. The negotiations with the North Western, already alluded to, for a joint piece of line here to save the construction of two adjacent viaducts, and for a common station at Birmingham, caused further delay; so that work was not even begun on the Leamington Deviation or the Extension to Snow Hill Station till 1851, after all hope of any such arrangement had been abandoned. Snow Hill Station itself was not commenced till the end of January 1852, owing to difficulties in obtaining possession of the houses and other buildings which had to be cleared away.

By this time the $11\frac{1}{4}$ miles of the Oxford & Rugby Railway, from Banbury to the commencement of the Birmingham & Oxford beyond Fenny Compton, had been finished and the permanent way was being laid. The second line of rails between Banbury and Millstream Junction, south of Oxford, had been laid but not



HARBURY CUTTING, 1852

brought into use, and the new Oxford Station on the west of the town was being built.

At last in September the whole line to Birmingham was ready for inspection. The chief works were: the Harbury Cutting, about half a mile long and no less than 110 feet deep with a short tunnel of 73 yards, which would have been longer but for a big landslip in 1850; the Leamington Viaduct, alongside that of the London & North Western Rugby & Leamington Line.¹ with a

¹ Opened 1st March 1851.

bridge of 105 feet span over the High Street; an aqueduct carrying the Warwick & Napton Canal over the railway; a 160 foot bridge over the Avon; an iron girder bridge 150 feet long over the canal and a road at Warwick; a timber viaduct over the reservoir at Solihull 400 feet long; a high and long embankment near Acock's Green; a bridge under the Midland Company's Gloucester Line, which had, of course, to be made without stopping their traffic; another 150 foot iron bridge over the Warwick Canal at Sandy Lane; the Bordesley Viaduct of 58 brick arches; and last, the Snow Hill Tunnel, 596 yards long, on the incline of 1 in 45 from Moor Street up to the Terminus. Most of this was made as an open cutting and then covered, to comply with the Act of 1846. The land on top was afterwards sold.

Captain Douglas Galton was sent down by the Board of Trade on the 14th September to inspect the line, with special instructions to see that the Mixed Gauge was complete. He found all the works sufficient as regards construction and strength, and the Mixed Gauge complete on both lines between Banbury and the junction with the branch to join the London & North Western in Birmingham, but on the remaining mile thence to the Snow Hill Station the narrow-gauge rails had not been laid though the longitudinal timbers to carry them were in position. The branch itself, already referred to as the Duddeston Viaduct, was far from finished, several arches being still in progress and no permanent way laid. He therefore reported that the line might be opened as far as the junction, but not beyond it, either towards Snow Hill or the North Western, "by reason of the incompleteness of the works and permanent way."

Although there was no immediate prospect of their

being used, the narrow-gauge rails into Snow Hill were forthwith laid, so after a second inspection a fortnight later the Board sanctioned the opening of the main line throughout. At the same time permission was given to open the second or Up line from Banbury to Millstream Junction, Oxford, which was laid with Mixed Gauge as far as the Isis Bridge half a mile south of the new station, the addition of a narrow-gauge rail on the remaining mile being apparently dispensed with as useless. This second line was to be used as a single line for all traffic while the Down line, which had remained Broad only since its opening in 1850, was being altered to Mixed Gauge.

The original stations on the new line north of Banbury were Cropredy, Fenny Compton, Southam Road and Harbury, Leamington, Warwick, Hatton, Knowle, Solihull, Acock's Green, and Birmingham,¹ the last being merely a large wooden shed run up in a hurry for the opening; though intended to be only temporary, it did duty with little alteration for nearly twenty years. Those at Oxford, Banbury, and Leamington had all-over roofs of Brunel's usual style. At Leamington only broad-gauge trains could enter the station, the mixed-gauge lines being carried outside it by a loop to the north-east, provided with narrow platforms and sheds of its own.

The opening of the new broad-gauge line to Birmingham was by no means auspicious. Public traffic being advertised to begin on the 1st October 1852, a special inaugural trip of Directors, officers, and friends was

¹ Kingswood (now Lapworth) and Bordesley were added in 1855, Smallheath in 1863, Olton in 1869, Widney Manor in 1899, Tyseley in 1906, and Moor Street in 1909.

arranged for the previous day, to leave Paddington at 9 and Oxford at 10.20, run to Birmingham, pick up more friends there and return to Leamington for the feast usual on such joyful occasions. The train consisted of ten carriages drawn by the famous *Lord of the Isles*, which had only begun work in July after a preliminary holiday at the Great Exhibition. Only one of these



LEAMINGTON STATION, 1852

carriages, a second-class next the engine, empty save for a Guard, had a brake, and the special was actually timed to reach Banbury on the old Down line only five minutes after the ordinary train from Didcot, a notoriously unpunctual mixed train of passengers and goods. Needless to say, the Traffic Department was asking for trouble, and got it. Owing to delays at Reading and Didcot the special left the new station at Oxford, not yet open to the public, more than half an hour late, but the mixed train was later still by the time it reached Aynho. There it was

engaged in detaching two goods waggons when the roar of the approaching special was heard. The driver at once put on steam to get away, the coupling between the carriages and waggons snapped, and a few seconds later *Lord of the Isles* dashed into the latter, smashing one to bits and driving the rest on to the receding carriages. These were not much damaged, but six passengers in them were a good deal shaken and hurt. The damage to the special was confined to the engine, neither the tender nor any of the carriages was injured, and the passengers escaped unhurt, a striking advertisement of the safety of the Broad Gauge. *Lord of the Isles* broke her buffer beam, was thrown off the rails by an axle of the smashed waggon, and tore up much of the stonework of the platform. It appears that none of the people on the engine, Gooch himself among them, knew the road, and so were misled by a disused signal a short distance south of Aynho, which had been left showing *All Right* after the temporary ballast siding it protected had been removed, and which they mistook for the Auxiliary or Distant Signal. Then when the Station Signal at *Danger* came in sight the brake power was utterly insufficient to stop the heavy train. The fact was that the signals, which had sufficed for the single line branch, had not been brought up to main line standard, and the Board of Trade Inspector had some unpleasant remarks to make on the recklessness displayed in the timing, formation, and speed of the special, and on the chronic unpunctuality of the ordinary train.

The delay caused by this accident put an end to the trip to Birmingham. The engine of the ordinary train, after taking its own two carriages on to Banbury, returned for those of the special and eventually dragged them to

Leamington, whither another special train, ordered by telegraph, brought the Birmingham guests. "At four o'clock about 180 ladies and gentlemen sat down to a sumptuous dejeuner in the Royal Hotel."¹

Next day, Friday, 1st October 1852, the line was opened for passenger trains only, and the expresses were timed to cover the 129 miles from Paddington to Birmingham in $2\frac{3}{4}$ hours. Goods traffic did not begin till February 1853, and remained very limited till after the opening of the railway to Wolverhampton.

The Mixed Gauge was laid in the manner proposed by Brunel and sanctioned by Captain Simmons on behalf of the Railway Commissioners in 1847, with three rails on each line and the common one outside so as to bring carriages of both gauges up to the platforms. Henceforth all mixed-gauge railways were made thus, and the Gloucester-Cheltenham piece remained the only one with common inner rails; on this the Broad Gauge had been added to an existing narrow-gauge line and there was no intermediate station.

Between Oxford and Birmingham the third rails were of course quite useless for traffic, there being no connection with any narrow-gauge railway; they were, however, used by the contractors for the permanent way, who did the necessary ballasting with narrow-gauge engines and trucks of their own. In June 1853 the Oxford, Worcester & Wolverhampton Company opened their railway to Wolvercot, some three miles north of Oxford, and were allowed to run their narrow-gauge passenger trains over the Great Western between the new junction there and Oxford Station, where sundry sidings were then laid in for their use. Until this time, and

¹ *Railway Times*, 2nd October 1852.

elsewhere, the third rails were confined almost exclusively to the running lines, being laid only to carry out the legal obligation. No further use was made of them till after the connection had been opened with the Shrewsbury lines north of Wolverhampton, and very little till they had been extended to Basingstoke at the end of 1856.

The opening of the Birmingham & Oxford Railway brought into force the general reduction of rates and fares over the whole Great Western system decreed by the Acts of 1846 and 1847, and this at a time when the capital was largely increased by the payment for that line and the traffic thereon was quite undeveloped, goods traffic not having even begun and the passenger accommodation at Birmingham being most inadequate. The Directors had, however, long foreseen that hard times would ensue on the first opening northward and had provided a small reserve fund, by drawing on which they were able to keep the dividend for 1853 up to the then normal figure of 4 per cent.

The only addition to the system made this year was the first five miles of the Hereford, Ross & Gloucester Railway from Grange Court to a temporary station called Hopesbrook, just short of the Lea Tunnel, opened on the 11th July. It was a single line worked by one engine.

In Parliament 1853 was a very bad year for the Broad Gauge. Proposals to lay it on the three Railways between Wolverhampton and Birkenhead and the Shrewsbury & Hereford line, and on the South Staffordshire from Wednesbury to Dudley, and Bills for new lines from Maiden Newton in Dorsetshire to Stoke Canon near Exeter—the “Devon & Dorset Railway”—and from Worcester to Hereford, a mixed-gauge project, were all rejected. The only new powers the Great Western

obtained were to revive the Henley and Uxbridge branches, to execute additional works at Reading, Chippenham, and elsewhere, and to run over the hostile Oxford, Worcester & Wolverhampton Railway between Priestfield and the junction with their own connecting line to the Shrewsbury & Birmingham, not far north of the joint Low Level Station at Wolverhampton.

The new Paddington Station made good progress during the year. In August Brunel reported:

The works at Paddington Station for the passenger trains are still much in arrear, but are advancing towards completion.

The alteration of the main lines, approaching Paddington, has been effected, and the Engine-house is in course of construction upon the site of the original line of Railway. As soon as it is completed, the old Engine-house may be removed and the extension of the Goods Department, so much needed, may be commenced.

Another £50,000 was required for the goods station, and at the same time the Directors took £25,000 for the construction of a new dock, canal wharfage, buildings, and sidings at Bull's Bridge (Hayes), for the transfer of coal, which was just beginning to come from South Wales, to barges going by the canal to the Thames and so down to the Docks.

The Departure side of the new station was at last ready enough to be brought into use on the 16th January 1854, but the roof and Arrival side were still far from finished. In Brunel's words: "the difficulties of proceeding successively with different portions of the new work on the site of old buildings, without interfering too much with the carrying on of the traffic in a Station, already far too small for the wants, have been very great; but after the removal of the Engine House we shall, I trust, be somewhat relieved from the present difficulties."

On the 29th May the Arrival Platforms were opened, and the passenger arrangements transferred to the new station, of which all the principal works had been by this time completed, but the new engine-house was not ready and so the goods station was still delayed. By the following February the passenger station had been finished except for painting, and the engine-house was ready for use but not yet occupied. Soon afterwards the old engine-house was pulled down and the second goods shed begun on its site. Carriage repair shops commenced about this time were finished in the summer of 1856, but the goods station arrangements, including hydraulic machinery for lifting and moving trucks, were not finally completed for yet another year. From first to last the new station cost the Company over £650,000.

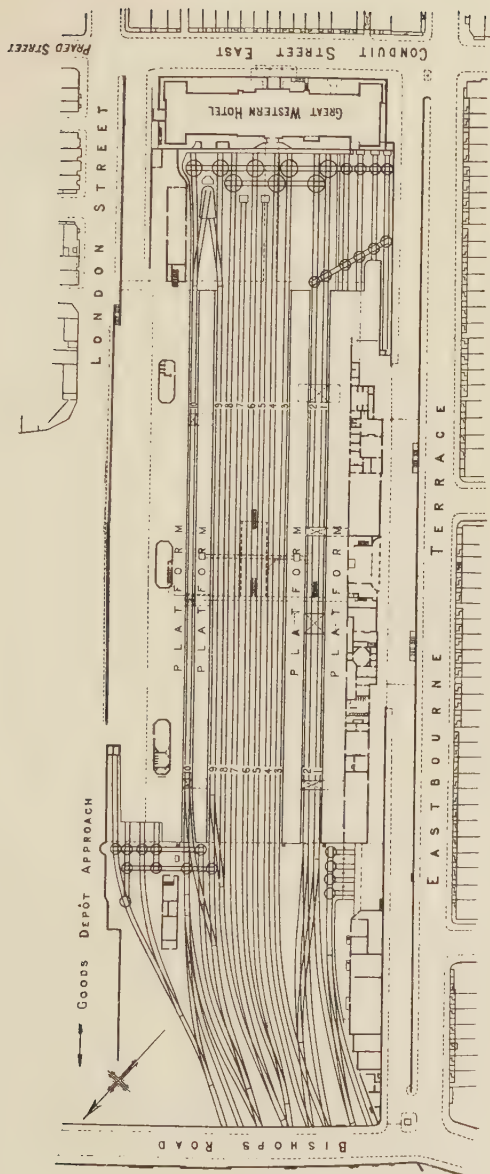
The passenger station is thus described in Brunel's *Life*:

The interior of the principal part of the station is 700 feet long and 238 feet wide, divided in its width by two rows of columns into three spans of 68, 102, and 68 feet, and is crossed at two points by transepts 50 feet wide, which give space for large traversing frames. The roof is very light, consisting of wrought iron arched ribs, covered partly with corrugated iron and partly with the Paxton glass roofing, which Mr. Brunel here adopted to a considerable extent. The columns which carry the roof are very strongly bolted down to large masses of concrete, to enable them to resist sideways pressure.

It is no small tribute to Brunel's foresight that this station of 1854 sufficed for the traffic without extension for more than fifty years. He was assisted in such few ornamental details as there are by Sir Matthew Digby Wyatt, a famous architect of the period.

The hotel was proceeded with at the same time as the station buildings, and leased to a Company formed for

PADDINGTON STATION IN 1854



the purpose by some of the Great Western officers and shareholders. On the 9th June 1854 H.R.H. Prince Albert, accompanied by the Prince of Wales, paid a visit of inspection and, according to the *Morning Post*, was much pleased with the house and general arrangements. It was opened for business the same day under the management of a Mr. Wheeler, late steward of the Union

Club. Brunel was one of the Directors, and soon became the Chairman of the Company.



GREAT WESTERN ROYAL HOTEL

The same Monday, 29th May, which saw the opening of the Arrival side of the new Station at Paddington, was marked by the invasion of the citadel at the other end of the line by the narrow-gauge trains of the Midland Company, who had at last finished their new line from Gloucester to Standish alongside the Great

Western and the addition of narrow-gauge rails to the former Bristol & Gloucester Railway thence to Bristol, authorised in 1848. From their junction into and throughout both the passenger and goods stations at Temple Meads the additional rails were laid by the Great Western. Brunel reported this work in August as an effective reply to the oft-repeated assertions of Robert Stephenson and others that Mixed Gauge was altogether impracticable in a station yard. He wrote:

At the Bristol end of the line a considerable work, which for a length of time has caused great apparent confusion in the Station, has been carried on at the expense of the Midland Railway Company and for their use, the mixed gauge having been laid throughout this Station. The execution of this, without interruption to the large traffic of the Station, was a work of some difficulty, and was rather a severe test of the possibility of working the mixed gauge in a complicated Station not designed for the purpose. The whole has now been in use for some time.

Considerable additions were made to the locomotive workshops at Swindon at this time, in view of the opening



PADDINGTON STATION, *c.* 1855

of the northern line, £25,000 being voted for the purpose in August 1853, and £5,000 more for house accommodation at New Swindon a year later. It is worth recording that, when laying the foundation stone of the new shops in May 1854, Gooch took occasion to state that during the sixteen years he had been connected with the Company no strike or other symptom of disaffection between the workmen and Directors had occurred.

A branch to High Wycombe was opened on the 1st August from "Wycombe Junction," close to the town of Maidenhead and about a mile and a half west of Maiden-

MARLOW ROAD STATION, *c.* 1869

head Station. This was made by the Wycombe Railway Company of 1846, which had been revived by an Act of 1852, and leased to the Great Western at a fixed rent. It was a single line of cheap construction, not quite ten miles long, laid with Barlow rails¹ weighing 90½ lbs. to the yard and 12 inches wide at the bottom. There were two timber viaducts near Bourne End, one over the Thames, and the other over an adjacent meadow

¹ See p. 570.



BOURNE END TIMBER VIADUCT

called Cock Marsh which was liable to floods, and five intermediate stations, named Maidenhead (Wycombe Branch)—near but not at the junction—Cookham, Marlow Road,¹ Wooburn Green, and Loudwater.

The construction of the Birmingham, Wolverhampton & Dudley Railway between Snow Hill Station, Birmingham, and Priestfield, where it joined the Oxford, Worcester & Wolverhampton, a mile and a half from Wolverhampton, was begun in 1851, after the failure of the negotiations with the London & North Western Company for joint use of the Stour Valley Line.

Brunel was not the Engineer for this, but one John Robinson McClean, Engineer and Lessee of the neighbouring South Staffordshire Railway.

After a disappointment in the spring, this line and the short Great Western bit, authorised in 1852, to connect the Oxford, Worcester & Wolverhampton Railway, half a mile north of Wolverhampton Station, with the Shrewsbury & Birmingham Railway at Stafford Road, were at last ready for inspection by the Board of Trade in August 1854. The intervening portion of the Oxford, Worcester & Wolverhampton Railway had already been finished, and it was of course of the utmost importance to get the line from Birmingham to the Shrewsbury Railway open by the 1st September, when the amalgamation of the latter with the Great Western took effect and its running powers over the Stour Valley Line consequently ceased.

Captain Douglas Galton of the Board of Trade passed over the new line on the 25th August, intending to return very soon to complete his inspection. Next day a large wrought-iron girder bridge, described by Captain Galton

¹ Renamed Bourne End in 1874.

as a tubular bridge of 63 feet span, across the Winson turnpike road between Soho and Handsworth Stations fell into the road immediately after the safe passage of an engine with two ballast waggons!

Brunel was thereupon sent down to inspect all the works, with the result that no less than five of McClean's girder bridges were condemned as too weak, and had to be replaced or strengthened. This caused a delay of more than two months; the line was not again ready for inspection till November. Captain Galton's report then being satisfactory, it was opened for passenger trains without any ceremony on Tuesday, the 14th November 1854, together with the short junction line to the Shrewsbury & Birmingham beyond Wolverhampton.

Both were double mixed-gauge lines, the former 11 miles, the latter three-quarters of a mile long, as were also the intervening two miles of the Oxford, Worcester & Wolverhampton Railway. Between Birmingham and Wolverhampton there were intermediate stations at Hockley, Soho, Handsworth and Smethwick, West Bromwich, Swan Village, Wednesbury, and Bilston, and all Down trains stopped short of the junction at Priestfield for the collection of tickets. The joint Low Level Station at Wolverhampton was another one-sided station, even more peculiar, not to say dangerous, than those at Reading and Slough, in that the main passenger lines crossed each other twice—in the middle of the station and at the very mouth of the tunnel. The accommodation for goods traffic at many of the stations was not ready for nearly a year after the opening. There were two short tunnels, respectively 135 and 160 yards long between Birmingham and Hockley, and another of 412 yards north of Swan Village.

From the first day trains of both gauges were worked over the line, those from north of Wolverhampton running on to Birmingham and starting thence for Shrewsbury and Chester, while the local trains were broad-gauge. No difficulty was experienced in working the Mixed Gauge, as Brunel took care to point out in his report of February 1855:

The Birmingham, Dudley, & Wolverhampton Railway was opened in November last ; the Mixed Gauge upon this Line, which is carried out to the fullest extent ever contemplated, or which is possible on any railway, both on the Main Line and in the numerous Stations and Sidings, has been worked from the day of opening with trains of both Gauges, and, as I fully expected, with perfect success, without any difficulty and indeed without requiring any effort or peculiar attention and without creating any observation.

In like manner, at Wolverhampton, in a Station occupied jointly with the Oxford, Worcester, & Wolverhampton Railway Company, while the Station has been in progress, and it is yet incomplete, the traffic of all our Narrow Gauge Lines from the North and all our Broad Gauge Traffic from the South, meet and cross each other ; and together with the Narrow Gauge traffic of the Oxford, Worcester, & Wolverhampton Railway, have been carried on without difficulty and without any interruption or accident, in a Mixed Gauge Station of a complicated arrangement.

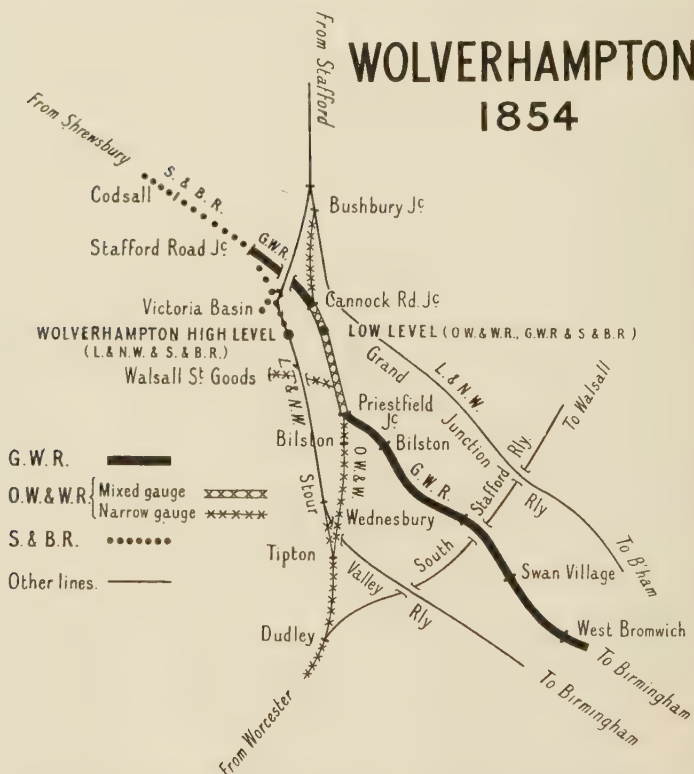
The Goods Sidings and Stations are being completed as rapidly as possible ; they will be of a very complete character, and afford a very large amount of accommodation. I expect that in a month or two we shall be able to enter into the use of a considerable portion of them.

The Engine and Carriage Establishment at Bordesley on the south side of Birmingham is nearly completed, and will be occupied by stock of both Gauges very shortly ; and, with the Station making at Coventry Road, will add greatly to the facility of carrying on the very large local Passenger traffic of that neighbourhood.

There was extraordinary delay with these goods stations. In August 1855 they were "in some cases completed and in use, and in others, with the exception of Wednesbury, nearly completed ; the communications

with the Birmingham Canal are also in a forward state.” They were not even finished in the following February, more than a year after the opening:

Upon the Birmingham & Wolverhampton Line, the principal Works of the extensive Station accommodation and the communi-



cations with the Canal, which the probable future traffic upon this line appears to require, have been executed, and have more or less been brought into operation, and generally require only the extension and completion of Sidings and Permanent Way, Rails and Fittings, to render them thoroughly efficient.

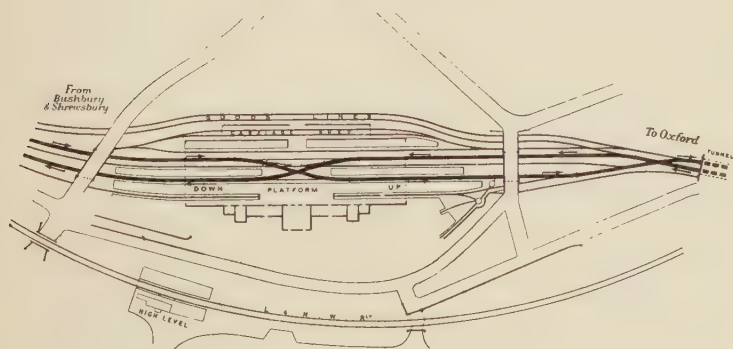
It is not surprising to find that by this time some

shareholders were beginning to complain that goods traffic was neglected on the Great Western. Of course no through traffic from north of Wolverhampton to London was possible owing to the break of gauge; all had to be transferred. For this purpose a transfer station, the first on the Great Western, was established in the Victoria Basin Depot of the former Shrewsbury & Birmingham Company, whither the broad-gauge rails were extended from the junction at Stafford Road. The Wolverhampton Town Goods Station for both north and south traffic was also established in the same yard at Herbert Street. Meanwhile the northern goods traffic continued to be dealt with at the High Level Station.

Down in Somersetshire the single line branch from Frome to Radstock, $8\frac{1}{2}$ miles, was opened for coal traffic on the same day as the line to Wolverhampton—14th November 1854.

WOLVERHAMPTON JOINT STATION

1856



*Note: Main Lines shown thus ———
All Lines Mixed Gauge*

CHAPTER VIII

THE SHREWSBURY RAILWAYS

The Shrewsbury & Chester.

North Wales Mineral Railway—Shrewsbury, Oswestry & Chester Junction Railway—Opening Chester to Ruabon—Dee Bridge Collapse—Opening to Shrewsbury.

The Shrewsbury & Birmingham.

Early Projects—Two Companies—Stour Valley Railway—Shropshire Union—Joint Lines—Opening Shrewsbury to Wolverhampton.

The Fighting Shrewsburies.

The Challenge—Battle of Chester—Birkenhead Railway—Alderman Bancroft—Boats on the Dee—Rate Cutting—Bad Faith—First Battle of Wolverhampton—General Baker—Great Western Alliance—Stormy Meetings—The Chairman's Night-cap—Forged Seal—The Euston Troupe—Their Local Rivals—Second Battle of Wolverhampton—Stour Valley Blockade—Birkenhead Hostility—The Alderman and his Bailiffs—More Stormy Meetings—Peace at last—Amalgamation with Great Western—No Broad Gauge—Enemy spiteful to the last—Domestic Affairs.

THE SHREWSBURY & CHESTER RAILWAY

A RAILWAY from Chester to the Wrexham and Ruabon coalfields was projected in 1839, George Stephenson being engaged as Engineer, but after the line had been laid out and plans deposited with the Clerks of the Peace, the scheme was abandoned owing to commercial depression. It was revived in 1842, only to be again stifled, this time by the opposition of land-owners and general apathy.

Nothing daunted, the promoters, among whom the most

active were Robert Roy and J. B. Ross, again took the field in the Parliamentary Session of 1844, and in spite of great opposition carried their Bill incorporating the North Wales Mineral Railway Company with power to make a railway from Chester to Wrexham. The Engineer was Henry Robertson, and the line he laid out began at the River Dee at Saltney and terminated close to the old mansion of Bryn-y-fynnon at Wrexham, where the station was to have been. Instead of running into the City of Chester, it joined the Chester & Holyhead Railway, which had been authorised in the same session, not quite two miles from the already existing terminus of the Birkenhead Railway. Notwithstanding its title, the line had no connection with any of the coal or iron works, the intended branch for this purpose having been abandoned owing to the jealousies of rival mine owners. This was remedied in the following year, when, in addition to an extension of the main line from Wrexham to Ruabon, a branch from a point about ten miles from Chester, known later as Wheatsheaf Junction, to Brymbo and Minera was authorised, to be followed in 1846 by further branches to Broughton and Gwersylt.

The Extension Act of 1845 is noteworthy in having conferred on Sir Watkin Wynn and his successors, owners of Wynnstay, the right of appointing a director of the railway, a right preserved in all the subsequent amalgamations till it at last extended to a system considerably more than a hundred times the size of the North Wales Mineral Railway.

In the mania year, 1845, a rival project for a direct line from Chester to Shrewsbury was promoted by the Chester & Holyhead Company and the Birkenhead interest, backed by the London & Birmingham in

furtherance of its policy of encouraging lines to the north independent of the Grand Junction. The North Wales Mineral met this scheme by promoting a continuation of their own line to Shrewsbury under the title of the Shrewsbury, Oswestry & Chester Junction Railway with Henry Robertson as engineer and Messrs. Roy and Ross prominent Directors. The rival direct line being eventually abandoned and the landowners having been pacified, the Shrewsbury, Oswestry & Chester Junction Bill passed through Parliament unopposed and received the Royal Assent on the 30th June 1845.

Next year the two Companies were amalgamated to form the Shrewsbury & Chester Railway.

Meanwhile the works of the North Wales Mineral had been steadily pushed on, and the line to Ruabon was opened to the public on the 2nd November 1846, together with the portion of the Chester & Holyhead Railway between the Birkenhead station in Chester and Saltney, which was used under an agreement by the Shrewsbury & Chester Company's trains.

Robertson's report to the first Meeting of the amalgamated Company, held a few days before the opening, describes the line as passing over a level country to "the Rossett"—"the" was generally prefixed to the name of this place at the time—with remarkably light works; thence it proceeded up the side of the Gresford Vale with deep cuttings and embankments to Wrexham, and so on to Ruabon. At $2\frac{1}{2}$ miles from the Birkenhead Terminus in Chester there was a short branch to a wharf on the Dee at Saltney, and at 10 miles the branch to Minera, not yet finished, left the main line, passing through the centre of the coal and iron district to the lime rocks at Minera, with two tunnels respectively about

220 and 400 yards long. The North Wales Mineral Line terminated at a point near Rhosymedre, a mile beyond Ruabon, where the Shrewsbury, Oswestry & Chester Junction began; the length of the main line was 16 miles, and of the Dee and Minera branches $\frac{1}{2}$ a mile and 6 miles respectively, making a total of $22\frac{1}{2}$ miles. An engine-house and workshops were established on the Dee Branch at Saltney.

The railway had only been open for six months when,



DEE BRIDGE, CHESTER, 25TH MAY 1847

on the 24th May 1847, an evening train to Ruabon was precipitated into the River Dee by the collapse of the bridge just outside Chester. This bridge, for which Robert Stephenson, as Engineer of the Chester & Holyhead Railway, was responsible, was formed of cast-iron girders in three oblique spans of 98 feet each on stone piers, and the left girder of the span farthest from Chester broke in two places under the train. The engine got across safely with its tender off the rails, but the carriages all fell into the river 36 feet below. Of the thirty-five people in the train, five, including the fireman, who was

jerked off the tender, were killed, all the rest except the driver, who alone escaped scot free, being more or less seriously injured. This accident caused a great stir at the time, and cast considerable doubt on the safety of cast iron as a material for railway under-bridges.

The Minera Branch with its two rope-worked inclines was opened for mineral traffic in July 1847, and two small branches out of it to the Brynmally and Ffrwd collieries in the following November.

On the portion of the main line between Ruabon and Shrewsbury the chief works, on which the completion of the whole depended, were the two great viaducts over the valleys of the Dee at Cefn and the Ceiriog at Chirk. Of these, the former is 510 yards long and 148 feet high, consisting of nineteen stone arches with a span of 60 feet each, and at the time was said to be the largest viaduct in the country. It was designed by the Company's Engineer, Henry Robertson, and built by the great contractor, Thomas Brassey. On the 25th August 1848, the ceremony of keying the last arch was performed by W. Ormsby Gore, M.P., the first Chairman of the Shrewsbury & Chester Company, in the presence of a great gathering from Chester and the surrounding country; after which the company, to the number of 300, repaired to lunch in the goods shed at Ruabon, where no less than twenty-three separate toasts "were enthusiastically responded to in eloquent and glowing terms." The Chirk Viaduct, a somewhat smaller affair 283 yards long and 100 feet high, originally had twelve arches, ten of stone of 45 feet span and the extreme arch at each end of laminated timber with a span of 120 feet.¹

These two viaducts being at length finished, the line

¹ These were replaced by masonry in 1858-9.



DEE VIADUCT, CEFN



CHIRK VIADUCT

between Ruabon and a temporary station at Shrewsbury, on the rest of which the works were mostly of a light nature, was opened for traffic on the 16th October 1848, the first railway to enter Shrewsbury.

The original terminus of the Shrewsbury, Oswestry & Chester Junction Railway of 1845 was to have been at "the junction of Chester Street and Cross Street, in the Parishes of St. Mary and St. Aulkmund in the Borough of Shrewsbury," but in the following year Parliament authorised a short extension "from the authorised line near the Sun and Ball Inn in the Parish of St. Aulkmund to a Yard in Castle Hill Street in Castle Foregate and the Parish of St. Mary," and here a large joint passenger station was agreed upon by the four Companies—Shrewsbury & Chester, Shrewsbury & Birmingham, Shrewsbury & Hereford, and Shropshire Union. It was finished in time for the opening of the Shrewsbury & Birmingham and Shropshire Union's joint line from Wellington on the 1st June 1849.

At the other end of the railway, the General Station at Chester, also the joint property of four Companies—Shrewsbury & Chester, Chester & Holyhead, London & North Western, and Birkenhead, Lancashire & Cheshire Junction—had been brought into use on the 1st August 1848.

Notwithstanding the title of the Shrewsbury, Oswestry & Chester Junction Railway, the line as constructed left the town of Oswestry more than two miles off on the west. In 1846, just before its union with the North Wales Mineral, the Company obtained power to make two branches, one from Gobowen through Oswestry to join the authorized Crewe and Newtown line of the Shropshire Union Railway & Canal Company at Crickheath,

SHREWSBURY AND CHESTER RAILWAY.

TIME AND FARE TABLE, on and after 28th NOVEMBER, 1846.

Notice. The time of arrival stated below, denotes when the Trains may be expected; but Passengers, to ensure being booked, should be at the principal Stations Five Minutes, and at the Road Stations Two Minutes earlier, on the day of the Railway Office, and be absent at the hour fixed for the departure of the Trains.

DISTANCE.	Down Trains from Shrewsbury.										Sunday Trains.						Fares from Shrewsbury.					
	I.		II.		III.		IV.		V.		I.		II.		III.		First Class.	Second Class.	Third Class.	Day Tickets.		
	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.	1, 2, 3.				1, 2, 3.	1, 2, 3.	
	STATIONS.	1.	2.	3.	1.	2.	3.	1.	2.	3.	1.	2.	3.	1.	2.	3.	1.	2.	3.	1.	2.	3.
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WREKHAM	7.50	8.55	12.50																			
WREKHAM	7.55	9.00	12.55																			
ROBESON	8.00	9.05	13.00																			
WREKHAM & DOBROUSLEY	8.05	9.10	13.05																			
SALTFLEY	8.14	9.19	13.14																			
CRUXTON	8.25	9.30	13.25																			
Middleton	8.30	9.35	13.30																			
SUTTON	8.35	9.40	13.35																			
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near Llanymynech, the other from Leaton to the little town of Wem. The former was opened as far as Oswestry on the 23rd December 1848, but the rest of it, as well as the whole of the Wem branch, was afterwards abandoned.

Accommodation for exchanging traffic with the Ellesmere Canal belonging to the Shropshire Union was provided at Rednal early in 1850, but the Canal Company's basin was not ready, and in view of the hostilities which had then begun it is not likely that much, if any, use was made of it for some years.

The stock with which the Company began work is stated in the Directors' Report of February 1849 as 21 engines, 16 first-class, 27 second-class, 16 third-class, and 4 "stand up" carriages, 6 luggage vans, 11 horse boxes, 10 carriage trucks, and 914 waggons.

For the first twelve months the life of the Shrewsbury & Chester Railway as a local branch from Chester was peaceful and uninteresting, and its relations with its neighbours, the London & North Western and Birkenhead Companies, friendly; but no sooner had it become part of a through line from Wolverhampton by the opening of the Shrewsbury & Birmingham than all this was changed and bitter warfare ensued, to last until both the Shrewsbury Railways had become part of the Great Western.

THE SHREWSBURY & BIRMINGHAM RAILWAY

: In 1844 a railway from Birmingham through Dudley and Wolverhampton to Shrewsbury was projected by local people and warmly supported by the London & Birmingham Company, who went so far as to enter into a provisional agreement with the promoters to lease the

line on a guarantee of $4\frac{1}{2}$ per cent. and half surplus profits, and at the same time urged its extension to Chester. This was a move in their warfare with the Grand Junction Company, the intention being ultimately to form a competing line for the South Staffordshire and some, at any rate, of the Liverpool traffic. The Grand Junction on their part, besides supporting lines southward to meet the Great Western as we have already seen, got up a rival project between Wolverhampton and Shrewsbury, and also proposed a branch from their main line at Stafford to join it. The former eventually became the Shrewsbury & Birmingham Railway, the latter the Shrewsbury, Wolverhampton & South Staffordshire Junction Railway. The "Five Kings" having reported in favour of the London & Birmingham schemes and against those of the Grand Junction, both came before Parliament in the 1845 Session, but only to be thrown out, the Shrewsbury & Birmingham on Standing Orders.

Soon afterwards all the circumstances were completely altered by the agreement of the two chief combatants to amalgamate to form the London & North Western Railway Company. Upon this, the London & Birmingham repudiated its agreement to lease the Shrewsbury & Birmingham, and both withdrew their support from the rival Shrewsbury projects; they did not, however, oppose them save by continuing the promotion of the line from Stafford.

Left thus to their own resources, the Shrewsbury & Birmingham promoters agreed to a suggestion that they should leave the expensive Birmingham-Wolverhampton portion of their proposed line to a separate company promoted jointly by themselves, the London & North Western, and the Birmingham Canal Company, each of

whom was to subscribe a quarter of the capital, the remaining quarter being raised by public subscription. This was entitled the Birmingham, Wolverhampton & Stour Valley Railway, and commonly known as the Stour Valley. Though it retained its former title, the Shrewsbury & Birmingham undertaking was thus cut down to a railway from Shrewsbury to Wolverhampton only.

Bills for the Shrewsbury & Birmingham, Shrewsbury, Wolverhampton & South Staffordshire, Stour Valley, and Shropshire Union line from Stafford to Shrewsbury all came before Parliament in 1846, and all were passed. The first two provided for the amalgamation of the rival projects under the title of the Shrewsbury & Birmingham, which had been arranged at the last moment.

The Shrewsbury & Birmingham Company's Act authorised a railway "from the Parish of St. Mary in the town of Shrewsbury with a double terminus in the Parish of Holy Cross and St. Giles, Shrewsbury, to New Mill Street in the Parish of Wolverhampton," with a branch from Shifnal through Madeley to the ironworks at Dawley. Of the whole $29\frac{1}{2}$ miles, 10 between Shrewsbury and Wellington were to be the joint property of the Shrewsbury & Birmingham and Shropshire Union Companies, constructed at joint expense and managed by a committee of six Directors, three from each Company.

The final laying out and construction of the line was then taken in hand by the Company's Engineer, William Baker, one of Robert Stephenson's disciples, who was also Engineer for the Shropshire Union. It is interesting to find that as early as September 1846 the Shrewsbury & Birmingham Directors considered the advisability of making the bridges and tunnels wide enough to take the Broad Gauge, and directed him to report on the extra

expense involved. Six months later they ordered the tunnel near Oakengates, the only one on the line, to be made 28 feet wide for that purpose, the ordinary width for two narrow-gauge lines being 24 feet. At this time the only authorised broad-gauge railway anywhere near was the Oxford, Worcester & Wolverhampton, but it was no doubt anticipated that that gauge would eventually be sanctioned on the new Birmingham, Wolverhampton & Dudley, as had been intended by its promoters, and traffic from both of these was expected.

In the autumn of 1846 the London & North Western Company took two steps which were destined to have an important effect on the destinies of the Shrewsbury & Birmingham, by arranging to lease the Shropshire Union and the Stour Valley Railways from the two owning Companies. The Shropshire Union Railway & Canal Company, to give it its full title, had been formed by an amalgamation of the Ellesmere & Chester Canal, Shrewsbury Canal, and Montgomeryshire Canal Companies, and authorised in the mad session of 1846 to make railways from Calveley, on the Chester & Crewe Branch of the North Western, to Wolverhampton; from Shrewsbury to Stafford; and from Crewe to Newtown in Montgomeryshire; in all 155 miles, mostly to be formed by the conversion of the existing canals. It is hardly necessary to say that of all this extensive system only the Shrewsbury-Stafford line was ever made. To enable them to take the lease of this undertaking, the North Western Company promoted a Bill in the 1847 Session. This the Shrewsbury & Birmingham opposed, rightly scenting trouble from this competing line to Shrewsbury in the hands of that great Company. They were eventually induced to withdraw their opposition by an Agreement,

put into formal shape and sealed by the three Companies in the following October, that all traffic between Shrewsbury and other stations on the joint line to Wellington and stations south of Rugby should be pooled and divided in certain proportions, and that the North Western should not convey any traffic between the same joint line stations and Wolverhampton or any station on the Stour Valley Line, or use the Stafford line to compete for traffic properly belonging to the Shrewsbury & Birmingham. The latter Company being content with this Agreement, the Bill was allowed to pass and in due course became an Act.

In the same Session the North Western Company sought powers to lease the Stour Valley Railway, in which by reason of their acquisition of the Birmingham Canal they now held half the capital and hence a controlling interest, and duly obtained them, subject to a clause in the Act giving full running powers over the line to the Shrewsbury & Birmingham. The possibility of the latter's union with the Great Western was evidently contemplated as early as this, 1847, though no move in that direction had yet been made, for the Act provides that these running powers should cease in case the Shrewsbury & Birmingham should be leased to or purchased by or amalgamated with the Great Western, Oxford, Worcester & Wolverhampton, Birmingham & Oxford, or Birmingham, Wolverhampton & Dudley Companies.

About this same time, July 1847, an Agreement was made between the North Western and the Shrewsbury & Birmingham that the station at Wolverhampton and the line between it and the point where the Stour Valley Railway to Bushbury diverged from the Shrewsbury line,

which both Companies had powers to make, should be the joint property of the two Companies to be managed by a committee of three Directors of each. This arrangement was confirmed and elaborated by a clause in the Shrewsbury & Birmingham Act of 1849.

Of the two new railways to Shrewsbury, the Shropshire Union from Stafford was ready first. It was opened, together of course with the joint line between Wellington



SHREWSBURY STATION

and Shrewsbury, on the 1st June 1849. At this time Oakengates Tunnel was not quite finished, so the Shrewsbury & Birmingham were only able to open their own line as far as Oakengates Station, some $2\frac{1}{2}$ miles beyond the Wellington Junction. The rest of the line was opened throughout to a temporary station on the joint property at Wolverhampton (High Level) on Monday, the 12th November following. There were no engineering works of special interest on this railway; the Oakengates Tunnel is only 471 yards long.

From the day of its opening till it became part of

the Great Western five years later, the life of the Shrewsbury & Birmingham Railway was one long and bitter fight with the London & North Western. In this fight the Shrewsbury & Chester was its close ally, and the fortunes of the two Companies were so inextricably interwoven that they are best related together, in one story.

THE FIGHTING SHREWSBURYS

Long before the opening of the Shrewsbury & Birmingham line, that Company and the Shrewsbury & Chester had built hopes on carrying some of the traffic between Birmingham and the Black Country and Chester, Birkenhead, and Liverpool, hitherto monopolised first by the Grand Junction and then by the London & North Western. Indeed, this had been the intention of the London & Birmingham when in its war with the Grand Junction it had supported the Shrewsbury and Birmingham scheme and urged its extension by a direct line to Chester. The two Shrewsbury Companies therefore arranged to work such traffic through and divide the proceeds according to mileage. Not content with this, they rashly decided to induce passengers to use their line by charging less than normal fares. Needless to say this was a direct challenge to the North Western, and was quickly taken up as such. On the 16th October 1849 Captain Huish wrote to Mr. Roy, Secretary of the Shrewsbury & Chester, the following politely menacing letter:

DEAR SIR,

It is stated by the Shrewsbury & Birmingham Company that you are about to join them in opposing us, at low rates, between Birkenhead and Wolverhampton, and thence by coach to

Birmingham for passengers, and by canal for goods; will you tell me candidly whether this is the case. I trust not, and that your Company and ours may avoid the competition which has brought so much loss on other parties. I need not say that if you should be unwise enough to encourage such a proceeding, it must result in a general fight both by our Railway from Shrewsbury to Liverpool and by our Shropshire Canal, the only gainers being of course the public and the Shrewsbury & Birmingham Company. Let me hope, however, that there is no truth in the statements; or, if there is, that you will reconsider your measures.

Yours truly,

MARK HUISH.

Nothing daunted by this, Mr. Roy replied at once in an airy, not to say chatty, letter, the material parts of which are as follows:

This Company have always looked for a share of the through traffic on the opening of the lines to the south of Shrewsbury; the small difference in the length of the two lines making it a matter of course. It is a part, we think, of our legitimate traffic. It is intended to carry through passengers only, first, second, and third class, at reduced rates with each of our regular trains; the extent of the reduction will depend on the arrangements of your Company. For the present we look to 30 or 40 per cent., and you will be aware that as the addition of a few through carriages to our local trains occasions scarcely any expense, a much greater reduction would leave a handsome profit.

As to goods, you will learn from Mr. Skey¹ that you are misinformed, this Company being prepared either to continue or give up the amicable arrangements with your Shropshire Union ally, which since the first opening of the line have been carried on. Indeed, our explicit refusal to break off these arrangements with them was assigned by the Birkenhead Company as the leading reason for declining to accept a mileage proportion of the through traffic instead of their ordinary fares, a matter of too small amount on their short length to affect so large a question in one way or other, although it and other considerations may deprive them permanently of our goods traffic, and place it on the Shropshire Union Canal into Liverpool; or, according to circumstances, by the Dee and steamers, as the Runcorn trade is conducted.

¹ Manager of the Shropshire Union.

But although perfectly prepared to compete with you or them for whatever traffic we are entitled to, our Directors are equally prepared to arrange the whole questions that may arise, or any part of them separately by itself, on proper and reasonable terms.

I have thought it right to give you this explicit intimation of our views and position, and our disposition to arrange, in consequence of the terms of your letter, written, I have no doubt, in the hurry of business, in order that you may be perfectly aware that if a "general fight," as you express it, arise, it is not of our seeking, nor from any unreasonable views on the part of this Company.

Such a letter as this to the redoubtable General Manager of the North Western meant nothing but war. The Shrewsbury Companies were, of course, absolutely within their rights in joining to compete for the through traffic, but to do so by cutting fares against the richest Company in England was, to put it mildly, questionable policy. In those days rate cutting was a by no means unusual form of competition. It was never approved of or willingly adopted by Saunders, but with Captain Huish, on the other hand, it was a frequent weapon, and in the war with the Shrewsburys only one of many at his command.

Chester Station was the scene of the first battle. There the Joint Committee, on which the North Western with its subject, the Chester & Holyhead, and its terrorised ally, the Birkenhead, had a large majority, refused to allow passengers to be booked to Wolverhampton or beyond via Shrewsbury, and, on the Shrewsbury Company persisting, had their booking clerk dragged out of the office and his tickets thrown after him. The Birkenhead Company having declined to convey third-class passengers by more than two trains, one very early in the morning the other late at night, the Shrewsbury &

Chester established a service of omnibuses to and from Birkenhead. These were excluded from the station by barricades of wood and chains across the approaches. Their time bills and notices also were torn down. All this in a station of which the Shrewsbury Company were part owners was, of course, quite illegal, and they had no difficulty in speedily obtaining an injunction to stop it,



CHESTER STATION, *c.* 1860

which was confirmed on appeal by the Lord Chancellor on the 12th December.

Apart from this, relations with the Birkenhead Railway remained for the time comparatively peaceful, though that Company declined to join in any competition against the North Western, of whom they stood in great awe. A considerable quantity of goods traffic was exchanged between them and the Shrewsbury line at Chester, and this had not as yet been much affected by the war. In April 1850, however, their Chairman, James Bancroft, who gloried in the title of Alderman Bancroft, was

frightened into making an agreement with Captain Huish to withdraw all facilities from the Shrewsbury Companies, except such as they could by law demand, in consideration of the London & North Western guaranteeing to the Birkenhead weekly receipts equal to those of the preceding year.

This agreement was acted on by a letter sent to the Shrewsbury & Chester late on Saturday, the 4th May, refusing to continue through booking, forwarding their trucks for cattle, or interchanging carriages; so from the following Monday the passengers had to turn out at Chester to rebook, and the cattle trucks, which had been sent to Birkenhead in the usual course, were all returned empty, the cattle being loaded into North Western trucks and sent by that line. This effectually stopped the cattle traffic, of which the Shrewsbury had been carrying about forty trucks every Monday.

The latter Company then chartered a steamer to work flat-bottomed boats on the Dee to and from Saltney, and began to send their goods traffic that way, whereupon Captain Huish, his local Goods Manager, and the Traffic Manager of the Birkenhead met and concerted plans for attacking all their goods traffic by canal and road competition. The North Western were of course already doing all they could by means of their Shropshire Union Canal and their railway from Stafford, and were even running coaches and waggons from Chester to Wrexham and Oswestry. Now all goods from the Birkenhead Railway were to be sent to Shrewsbury and Wellington by Stafford, to Wrexham by waggons, and to Ruabon, Ellesmere, and Oswestry by the Canal from Chester. All loss entailed by these proceedings was to be borne by the London & North Western. This plan of campaign was

forthwith carried out, and continued in force for nearly six months, till the 23rd October 1850, when it was abandoned by the Birkenhead Company, whose Chairman had found considerable difficulty in defending it to his own shareholders at their Half-yearly Meeting. That the Birkenhead Company was fighting against its own interests was shown by the fact that the tonnage of goods received from the Shrewsbury & Chester during the half year to June 1850, was 38,795 as against 2,245 received from the North Western. The timid Alderman was also frightened by the proposal of the Shrewsbury Company to apply to Parliament for running powers over his railway. A sort of truce was therefore patched up and the worst obstructions withdrawn, the Shrewsbury at the same time discontinuing its boats on the Dee and the omnibuses to Birkenhead. They were, however, by no means satisfied with the position, and proceeded with their Bill for running powers.

While all this was happening in the Chester District, the North Western were by no means idle at the Wolverhampton end of the two Companies' line. In complete disregard of their Agreement of 1847, whereby they had got rid of the Shrewsbury & Birmingham's opposition in Parliament to their Bill for power to lease the Shropshire Union, they started a fierce competition at low fares and rates between Wolverhampton and Shrewsbury over that line round by Stafford, a distance of 46 miles against $29\frac{1}{2}$ by the Shrewsbury & Birmingham. The loss of a few thousand pounds of course mattered little to Captain Huish as long as he could crush the insolent little Companies, who had dared to challenge him at his own game of rate cutting. He already had a reputation for finding pretexts to avoid agreements which had become

inconvenient. On this occasion his pretext was that his Company had no legal power to make the Agreement of 1847, and that therefore, though they had received the consideration for it, they were entitled afterwards to dishonour their own signature, or rather seal. The Shrewsbury & Birmingham of course went to law and obtained an injunction to stop the competition from Lord Chancellor Cottenham; this was afterwards revoked by his successor, Lord Truro, subject to the condition that the North Western should keep an account of the traffic and that the validity of the Agreement should be tried by a common law action. This delayed matters till the end of 1851, when the Queen's Bench decided in favour of the plaintiffs, but on their then applying to Chancery for a new injunction, it was refused on another technical plea that the lease of the Shropshire Union to the North Western had never been completed and that therefore the Agreement had not yet come into operation. This was appealed against, but the Lords Justices eventually dismissed the appeal, without costs, however, at the end of June 1853, and the case does not appear to have been carried further.

All this time, save for an interval in 1850 while the injunction was in force, passengers were carried between Wolverhampton and Shrewsbury at ridiculous fares, eventually fixed at—first-class 1*s.*, second 9*d.*, and third 6*d.* Between Wellington and Shrewsbury, over the joint line, the fares were respectively 6*d.*, 3*d.*, and 1*d.* for the 10 $\frac{1}{4}$ miles.

At first the Shrewsbury & Birmingham were unable to deal with goods traffic for places south of Wolverhampton owing to lack of communication with the Birmingham Canal, though this adjoined the last half

mile of their line, which was joint property with the Stour Valley. In April 1850 they attempted to lay a siding for this purpose, whereupon their men were forcibly prevented by their late Engineer, William Baker, who had been succeeded by Henry Robertson of the Shrewsbury & Chester immediately after the opening of the line and beginning of the quarrel with the North Western, on the plea that the plan had not been sanctioned by the Joint Committee. This Committee met on the 7th May and referred the plan to their two Engineers, Messrs. Robertson and Baker, who settled it in time for the June meeting. No representative of the Stour Valley appearing at this, no business could, according to the Committee's by-laws, be done, but the plan having been signed by Mr. Baker, the Stour Valley Engineer, the Shrewsbury Company proceeded to make the siding. A large force of London & North Western navvies, under the command of Mr. Baker, thenceforth known in the district as "General" Baker, and accompanied in the rear by the North Western lawyer, were then marched on to the ground to stop the work, and only the prompt calling out of the police and military prevented a free fight.

As at Chester, an injunction from the Court of Chancery soon put a stop to this illegal violence, and under its protection the Shrewsbury & Birmingham made the siding, and later, on their own land adjoining, the Victoria Basin with its wharves and sidings.

In July Mr. Ormsby Gore, Chairman of the Shrewsbury & Birmingham and also of the Joint Committee of the two Companies formed to manage the through traffic, wrote to Mr. Glyn, the North Western Chairman, deprecating the ruinous competition and suggesting that the

traffic should be pooled and the share to which his Committee were entitled, as well as all other matters in dispute, referred to arbitration. This was peremptorily rejected by the North Western Board, who insisted on equal fares to all competing points. The Birmingham Company were disposed to agree to these terms, which seem to us eminently reasonable, but the Chester would not, chiefly on the ground that the handicap of crossing the Mersey by ferry boats would deprive them of any Liverpool passengers unless the inducement of cheaper fares was offered. For goods traffic the Shrewsbury Companies always had charged equal rates; in this case the North Western had been the first to reduce them at all competitive places.

All this time the London & North Western, as lessee from the Stour Valley Company, in which the Shrewsbury & Birmingham held a quarter of the capital, was going very slow in the construction of that railway, which would admit the latter's trains to Birmingham. The North Western had the old Grand Junction line to Wolverhampton, or rather to a station so called more than a mile from the town; hence they had no need to hurry, and the convenience of the public was a very secondary consideration compared with keeping their wretched little rival out of Birmingham. The Stour Valley Representatives also stayed away from the Joint Committee from May 1850 till the end of August 1851, thereby preventing any progress being made with the station at Wolverhampton.

Having suffered all this opposition and obstruction for more than a year, and feeling the ruinous results of the unequal warfare and the hopelessness of arranging satisfactory terms with the enemy, the two little Shrewsbury

Companies naturally looked for some ally who would have a common interest with them in developing traffic on their railways, and it is not surprising that they turned to the Great Western as the only Company able to help them and to face their oppressor on equal terms. Moreover, the Great Western was already by means of the Birmingham, Wolverhampton & Dudley Railway potentially at Wolverhampton, and the Shrewsbury & Birmingham were partners with them and the Oxford, Worcester & Wolverhampton in the proposed Low Level Station there under an Act of 1848.

To Paddington therefore went Mr. Roy of the Chester and Mr. Knox of the Birmingham, and there Saunders, having first satisfied himself that the two Companies were free to make arrangements with him, after several interviews settled a traffic agreement with them, which was adopted by the three Boards and sealed on the 10th January 1851. This provided for the mutual interchange of all traffic for each other's districts, the division of net receipts according to mileage, and the appointment of a joint committee to manage the through traffic, composed of four Directors of the Great Western and two of each of the Shrewsbury Companies, with an umpire to decide cases of difference. Until continuous communication was established goods were to be forwarded over the interval by canal. At this time, as we know, the Great Western was actually open only as far as Banbury.

This alliance with his great rival naturally enraged Captain Huish, and made the strife with the Shrewsburys still more bitter. He now, again too late, began the tactics which had so signally failed in the case of the Birmingham & Oxford Company. First the Shrewsbury & Birmingham Company was attacked; shares

were bought and divided among the denizens of the Euston Square and Camden Town districts, who had not long before figured as Birmingham & Oxford proprietors, circulars and proxy papers printed and broadcast, and much money spent in canvassing to strengthen the opposition to the Directors, which already existed. The fun began at the Half-yearly Meeting held at the Swan Hotel, Wolverhampton, on the 12th February 1851, at which a Committee of Investigation was agreed to by the Board and proceedings adjourned for a month to await its report. This was duly forthcoming at a crowded gathering in the Wolverhampton Assembly Rooms on the 12th March. After misrepresenting and censuring all the work of the Board, the Committee stated that they had reopened negotiations with the London & North Western and made a "preliminary arrangement" with that Company, which they produced. By this the Shrewsbury & Birmingham were to cease being carriers and hand over their line with all its rolling-stock to be worked by the North Western for twenty-one years, and abandon all legal proceedings against that Company, who in consideration of this were to pay them, *out of the traffic receipts of the Shrewsbury & Birmingham line*, dividends beginning at 3 and rising after four years to 4 per cent. The meeting was eventually adjourned for another month to enable the Proprietors to consider this and any reply the Directors might make. In the interval the Board issued a circular demonstrating the illegality of the proposed agreement without an Act of Parliament to authorise it, which there was not the remotest chance of their getting; and the fact that it guaranteed them nothing more than they had already in their own traffic, in view of the obvious absurdity of expecting a Company

with a line of its own to their principal towns to rob itself by transferring traffic to theirs; and also defending the traffic agreement with the Great Western as their natural ally, who would have an interest in putting traffic on their line.

A special meeting demanded by the opposition to consider the North Western Agreement began on the 4th April and lasted four days. The general uproar and confusion were terrific. Chairman, Directors, and Officers were unmercifully abused, especially Knox, the Secretary, who was an object of special hatred to the North Western party, he having taken a leaf out of their book by arranging the splitting of stock among the Company's staff, his own children, and friends. Mr. Ormsby Gore, who was supported by a Q.C. engaged to advise him on points of law, preserved an imperturbable calm throughout, and allowed both sides to talk and abuse each other to their hearts' content. Every now and then someone proposed a resolution for adjournment or what not, and each time a poll was demanded by the other side, the proceedings being suspended while it took place. On the evening of the third day—

The poll was proceeding and Mr. Gore was about to leave the Chair, but Mr. Scott rose and prevented him. He said—It is time a stop is put to this sort of thing. I object to your leaving the Chair; let the poll be taken in an adjoining room; we will remain here till the work is done.

The business was entirely suspended. Mr. Gore had however no alternative but to keep his seat. He quietly resigned himself to his fate. After sitting a couple of hours (most of the shareholders having gone away for refreshment) the honourable gentleman was relieved for a brief period by Mr. Clive, the Deputy Chairman. At seven o'clock the Meeting was in a state of the wildest uproar, and loudly protested against any adjournment, upon which Mr. Gore quietly sat down and began reading a volume of "Household Words." At nine, Mr. Gore brought from

his pocket a white night-cap, which he drew over his head, and sank apparently into a peaceful slumber, upon which the meeting was convulsed with laughter and appeared for the time restored to good humour.

The scrutineers shortly afterwards returned to the room, and said there was no probability of their being ready with the poll that evening, and a motion for adjournment till the morrow was submitted. The Chairman was awakened and asked to put it, which he did in drowsy tones and declared it carried.¹

Next day the resolution accepting the North Western terms and handing over the railway to them was put to the meeting, after the Chairman had read Counsel's opinion that such an agreement would be totally illegal and void. It was carried with immense applause, and Mr. Gore declared the special meeting over; notwithstanding which, the triumphant opposition proposed, put, and carried an adjournment thereof to the scene of their former Birmingham & Oxford fights—Dee's Royal Hotel, Birmingham, on the 7th May.

The adjourned Half-yearly Meeting was then proceeded with, the Directors' Report rejected, and a batch of new opposition "Directors"—quite illegally—appointed.

In the course of the following month the Great Western Company made an offer to the two Shrewsburys, which took the wind out of the sails of the opposition, and caused such genuine shareholders as had been misled by their assertions to reconsider their attitude. This was for a future amalgamation of all three in 1856 or 1857 at the choice of the small Companies on the basis of their net revenues in the preceding year, and in the meantime a guarantee out of the whole revenue from the London through traffic to places beyond Birmingham of a dividend beginning from January 1852 at 3 per cent. and rising to

¹ *Railway Times*, 12th April 1854.

4 per cent. in 1855. They also undertook, as the North Western had not, to obtain an Act of Parliament to sanction the arrangement. This offer was accepted by the Shrewsbury & Birmingham Directors, and a Special Meeting of the Company called for the 8th May to consider it.

At the opposition Meeting at Dee's Hotel on the 7th May, Mr. Gore having looked in for a moment to tell them it was not a legal meeting, the Chair was taken by Mr. Geach, M.P., a Director of the Company at variance with his colleagues, and the North Western party had things all their own way. As in the case of the Birmingham & Oxford four years before, a forgery of the Company's seal was produced and the Agreement with the North Western solemnly sealed therewith "amidst boisterous cheers."

Next day the Special Meeting called by the Directors was held at Wolverhampton, at which, after the defeat of a motion for adjournment till July, the opposition leaders having entered a protest against the proceedings withdrew, and the Agreement for amalgamation with the Great Western and Shrewsbury & Chester was approved, and forthwith sealed with the genuine seal of the Shrewsbury & Birmingham Railway Company. The resolution passed in February appointing the Committee of Investigation was at the same time rescinded and their powers annulled.

The London & North Western made no serious use of the forged-seal Agreement with them, which Captain Huish and his astute



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advisers well knew was not worth the paper it was written on. They did indeed go so far as to file a Bill in Chancery to enforce it, but after various dilatory proceedings this was dropped. At one time in July 1851 a rumour that they intended to run a train from Wellington to Wolverhampton with the object of taking forcible possession caused the Shrewsbury & Birmingham authorities to station a strong force of platelayers at the junction, who removed two rails from the Wolverhampton line, only replacing them temporarily on the approach of a Shrewsbury & Birmingham train. However, no such attempt was made, if it had ever really been intended. The former hostilities by obstruction and competition of course continued unabated.

Having failed to break the middle link in the prospective rival chain of communication between London and the Mersey, Captain Huish now concentrated his efforts on the northern portion. The special meeting of the Shrewsbury & Chester Company to confirm the Amalgamation Agreement, which the Directors had already entered into, was appointed for the 12th June, so a lively opposition was got up by the usual methods. A special train brought the famous Euston Troupe, 140 strong, to Chester, but the cunning Mr. Roy, who was now a Director, had prepared for them by endowing a rival band of Shrewsbury & Chester employés with a share or two apiece, so their performance was not as brilliant as usual. After much noisy recrimination, the Meeting was adjourned for a month, and the interval devoted to a war of circulars and rival canvassing. So desperate had Captain Huish now become that an offer of a guaranteed dividend of $4\frac{1}{2}$ per cent. was actually held out to the Company, with which a few months before the North Western would have nothing but war. His most

promising pupil, Edward Watkin, was put in charge of the campaign, and organised meetings to stir up trouble in London, Manchester, Edinburgh, and even as far away as Inverness. It seems that a good deal of Shrewsbury & Chester capital was held in Scotland. Watkin met with some success at the first two places, but at Edinburgh the Scots were almost unanimously against him, having recently, they said, had an example of his Company's bad faith in the case of an agreement with the Scottish Central. At Inverness only two or three shareholders troubled to attend, so the long journey was wasted.

The adjourned Meeting was held at the Royal Hotel, Chester, on the 16th July, and lasted till 10 o'clock at night. There was, of course, great uproar and confusion between the contending parties, but when it came to voting 17,831 were cast in favour of the Great Western Agreement and only 7,040 against it. The North Western offer of $4\frac{1}{2}$ per cent. was not made directly to the Board, and does not seem to have been taken seriously; besides which, the probability of Parliament ever sanctioning such a monopoly was generally regarded as very remote, and without such sanction any guarantee would be quite illusory.

Thus was the Great Western Railway potentially extended as far afield as Chester, just ten years after its opening from London to Bristol. Three years of strenuous fighting were to ensue before it actually got there, but the ultimate certainty of this was now assured. By the irony of fate, the author of this undreamed of extension of the original system was no other than the General Manager of the London & North Western. He it was, as we have seen, who invited the Great Western to come out of their own country at Oxford to Wolverhampton and to Birmingham, and then not long afterwards, by his

efforts to crush the two little Shrewsbury Companies, threw them into his great rival's arms. Captain Huish has been described as a great railway diplomatist, and no doubt the first step was a diplomatic one in his fight with the London & Birmingham Company, but that he did not foresee the obvious consequences of his treatment of the Shrewsburys is no testimony to his powers. That he did not foresee it is shown by the extravagant attempts he made, by offers of costly guarantees and otherwise, to break the alliance after it had been concluded. Yet the possibility of this very alliance had been contemplated by the North Western lawyers long before the fight with the Shrewsbury Companies began, when they provided in the Stour Valley Act of 1847 that the Shrewsbury & Birmingham's running powers should cease if they amalgamated with the Great Western.

It need hardly be said that the City of Chester was in itself no fitting termination of a main line of railway from London. Birkenhead with its docks and with Liverpool across the Mersey was the point aimed at, so as early as April 1851 the Associated Companies, as the Great Western and the two Shrewsburys came to be called, made overtures to the Birkenhead Company to join the Alliance.

The latter's full title was the Birkenhead, Lancashire & Cheshire Junction Railway, and it had, in December 1850, opened a line from Chester to a junction with the North Western main line at Walton near Warrington, whence under an agreement with the latter it worked its own traffic over their line into Manchester. Early in 1851 some through trucks from the Shrewsbury & Chester were sent over this line, only to be stopped by the North Western, who maintained that the agreement only covered the Birkenhead's own stock. Hence the Shrews-

bury's traffic had to be transhipped into Birkenhead waggons to get to Manchester, which effectually hindered the passage of any quantity of it. Matters were little, if at all, improved by another Birkenhead-North Western Agreement in June 1851, allowing other Companies' waggons to pass to Manchester, but only on condition that the former charged the full local rates on such traffic.

So matters stood while the Bill asking for running powers, which the Shrewsbury & Chester had introduced on account of the obstructions of the previous year, was before Parliament. In spite of strenuous opposition from the Companies concerned, backed up by the North Western, this Bill duly became an Act conferring full running powers over the Chester & Holyhead between Saltney Junction and Chester, which had hitherto been by agreement only, and also over the whole of the Birkenhead Railway, both to Birkenhead and Walton Junction, and authorising the Shrewsbury to make a station on the South Reserve at Birkenhead.

Influenced by the grant of these powers over his line and the views of his shareholders, Alderman Bancroft came to the conclusion that he had better make terms with the Associated Companies. The result of the negotiations was an Agreement between the four Companies, made in October 1851, and confirmed by the Birkenhead Proprietors in the following month, for a perpetual lease of the Birkenhead, Lancashire & Cheshire Junction Railway, with all its plant and the benefit of its agreements with other Companies, to the Associated Companies in return for a guarantee by them to the Birkenhead Company, of dividends, beginning at 3 per cent. and rising after three years to 4 per cent., together with an option to the latter at any time after the

amalgamation of the other three Companies and before January 1856 to amalgamate with them on a par basis. All this was subject to the necessary sanction of Parliament being obtained in 1852 or 1853, but meanwhile the Associated Companies were given power to convey any traffic over the Birkenhead, paying 60 per cent. of the receipts to the latter.

Hence at the end of 1851 an independent line from London to Birkenhead, as well as access to Manchester, seemed assured, and hopes of "the Broad Gauge to the Mersey" rose high at Paddington. How the exclusive possession of the Birkenhead was lost to the Great Western, not by the machinations of the enemy but by their own act, will be seen later. We must now turn our attention southward to the "Battle of Wolverhampton" and the long struggle to reach Birmingham from the north.

In spite of the dilatory construction of the Stour Valley Railway by the North Western Company, that line was practically finished early in 1851 if not before the end of 1850, but no attempt was made to open it, much to the annoyance of the inhabitants of the Black Country. In November 1851 the Shrewsbury & Birmingham gave notice of an application to Parliament for power to open the line themselves, whereupon the North Western published their intention of opening it on the 1st December.

Captain Wynne having inspected it and reported satisfactorily, the Board of Trade, on the 25th November, duly sanctioned its opening from the station at Navigation Street, Birmingham, to the junction with the former Grand Junction Line at Bushbury beyond Wolverhampton. This of course included the new joint (High Level) station at Wolverhampton.

As soon as the Shrewsbury & Birmingham Directors

heard of this intended opening, they notified the London & North Western that they would forthwith exercise their running powers over the line. The latter replied contending that the Shrewsbury Company had now amalgamated with the Great Western Railway and that their powers had therefore ceased, as the Act conferring them provided in that event. The Shrewsbury of course answered that they had not amalgamated with the Great Western but only agreed to do so at a future date, and therefore their running powers were in full force and they intended to exercise them.

The North Western then decided to postpone the opening on the ground of "imminent risk to the public from such a hostile attempt and the danger to be anticipated of a collision," and issued public notice to this effect late on Saturday, the 29th November, whereupon the Shrewsbury issued a counter notice that their trains would arrive at the new station, Wolverhampton, at specified hours, "and proceed over the Stour Valley Railway to Birmingham, as specially authorised by the Stour Valley Act of Parliament of 1847."

Now, although the North Western pretence that their running powers had ceased was quite unwarranted, this proceeding of the Shrewsbury Company was distinctly ill advised, not to say foolish. They had no right to run into the Birmingham Station, which was situated on the North Western's own Birmingham Extension line immediately beyond the termination of the Stour Valley; no tolls or regulations for the use of the line had been settled; neither had their engines been inspected or the times of their trains arranged with that Company; all of which were essential preliminaries to the exercise of the running powers.

However, they were as good as their word, and attempted to force a passage. The following account of the ensuing battle is extracted from the *Wolverhampton Herald* of the time.

The first Shrewsbury & Birmingham train was to leave about 9.15, and on arriving at the Wolverhampton station from Shrewsbury several persons who were desirous of going through, and others who had booked from the new station, were waiting to be conveyed to Birmingham. The London & North Western had caused their powerful engine "Swift" to be placed on the up line a little beyond the signal post upon the bridge leading to Mr. Bayley's chemical works, thus causing an obstruction to the progress of the Shrewsbury & Birmingham train. Several officials, policemen, and other persons connected with the London & North Western, surrounded the engine, quietly waiting for any further proceedings on the part of the Shrewsbury & Birmingham people. A little further up the line an engine and tender were placed across the up and down rails. Hundreds of people were congregated upon the line, and shortly after ten o'clock a strong body of the borough police were marched, under the command of Colonel Hogg, to the bridge on which the London & North Western engine rested. As a breach of the peace and a serious disturbance was expected when the train from Shrewsbury proceeded towards Birmingham, the military under the command of Captain Bellairs, stationed in the town, were ordered to be in readiness. The Mayor was also in attendance, and an army of police waited in the hall of the station.

About a quarter past 10 o'clock, the passengers having previously alighted, the engine of the Shrewsbury & Birmingham with guards and a 3rd Class carriage filled with men, who appeared to be servants of the Company, and with G. Knox, Esq., and several other Directors and gentlemen standing on the engine carriage, proceeded towards Birmingham, the whistle of the engine emitting its shrillest sound to signify their advance to the obstructing engine before them. When within 200 yards of the London & North Western engine, two fog alarm signals, which had been placed on the rails, exploded. No notice, however, was taken by the parties belonging to the London & North Western engine, save the continual waving of red danger flags, which a number of policemen held in their hands, and one of which had been also tied to the signal post.

The engine of the Shrewsbury & Birmingham slowly advanced in spite of the red flags hoisted, and amidst the cheers and

shouts of the assembled multitude, bunted against that of the London & North Western, which, being a very powerful engine, and the brakes being screwed tightly down, received but a slight shock from the concussion. The parties in charge of the London & North Western engine were then requested to move on but declined, and Mr. Baker, the engineer of the Stour Valley, who was on that engine, in reply to several questions knowingly shook his head. The two engines standing opposite each other in the closest proximity with the steam power of their gigantic bodies issuing from the various safety valves in voluminous quantities with a hissing noise presented an exciting spectacle, representing the antagonism of their respective proprietors.

As no satisfactory answer could be got from the London & North Western Officials, the Directors and other gentlemen on the opposing Company's engine got down and immediately obtained a summons from the Borough Magistrates against Mr. Baker, the engineer who was in charge of the engine, and Thomas Newbold, the engine driver, for obstructing the free traffic of the line.

So the battle terminated without bloodshed and the combatants adjourned to the Town Hall, where the proceedings led to an arrangement that the North Western Directors should meet at once to consider the Magistrates' suggestions for peace and the Shrewsbury & Birmingham suspend the active assertion of their rights for a month.

The North Western then appealed to the Board of Trade, giving their version of what had happened and urging the extreme danger to the public of opening the line, caused of course solely by the action of the Shrewsbury Company. At the same time the Wolverhampton Town Council passed and sent to the Board a resolution complaining of the delay in opening, and pointing out that provisions might easily be made to prevent any such danger. Although they had already sanctioned the opening and had therefore exhausted their powers in the matter, the Board then sent Captain Simmons to

reinspect the line, as a way out of the difficulty. He then found many elements of danger, especially a lack of certain signals, which had, curiously enough, escaped the notice of his colleague, Captain Wynne. The Board thereupon ordered the London & North Western to postpone the opening, which that Company had of course already done. After this they pretended to the public that they were anxious to open the line, but were prevented doing so by the Board of Trade on account of the wicked behaviour of the Shrewsbury & Birmingham. The signals required by the Inspector remained lacking till the end of March, when, the Shrewsbury Company having, in order to get the line opened, undertaken not to exercise their running powers without the decision of a court of law, the North Western proposed to open it on the 2nd April, and so erected them. But another difficulty now arose. No regulations for the joint station and mile of line at Wolverhampton, binding on the servants of both Companies, had been drawn up, so the Board of Trade refused their sanction to the opening of the Stour Valley, which extended on both sides of the joint line.

A separate dispute on the subject of this joint station had been going on between the two Companies since August 1851. The North Western wished it to be divided into two separate stations, one for each Company; the Shrewsbury objected on the ground of expense and insisted on the original Agreement and Act of Parliament, which made it a joint station, being kept to. The joint Committee, consisting of three Directors of each Company, being equally divided on practically every subject, did nothing; so when the station was ready for opening in November, each Company appointed separate staffs for

it, which, of course, created further unpleasantness. Both opponents then appealed to the Board of Trade, and the matter was eventually referred to the arbitration of Sir William Cubitt. He issued a preliminary report in April proposing to divide the station as the North Western wished, allotting the southern half to them and the northern to the Shrewsbury, whereupon the latter protested that he was exceeding his powers and repudiated the arbitration.

Needless to say, the inhabitants of the district through which the Stour Valley Railway passed were by no means pleased at its being kept closed, and their complaints increased as time went on. Several memorials were sent to the Board of Trade and the matter was taken up by the local Members of Parliament, besides being thoroughly ventilated before the Commons Committee on the Shrewsbury & Birmingham Bill for power to open the line themselves.

Eventually the President of the Board arranged a meeting at his office on the 8th June of a Wolverhampton Deputation and several M.Ps. with the Chairmen and solicitors of the two hostile Companies. After some discussion Mr. Glyn, the North Western Chairman, somewhat unwillingly agreed to open the line and the joint station forthwith, on condition that it was clearly understood the Shrewsbury & Birmingham would not try to enforce their running powers till a judgment had been obtained. Mr. Clive, who had succeeded Mr. Ormsby Gore as Chairman of the latter Company, at once agreed to this, and the deputation withdrew.

All the objections of the Board of Trade to the opening vanished at once as if by magic. They themselves, under their general powers, settled the dispute as to the

Wolverhampton Station, treating it as a joint one in accordance with the Act of Parliament, and appointing a station-master with entire control of the station and common piece of line; and also settled a code of rules binding on the servants of both Companies.

The Stour Valley Railway was accordingly opened at last for public traffic on the 1st July 1852 by the London & North Western Company, but, needless to say, the trains thereon were carefully arranged so as not to connect at Wolverhampton with those of the Shrewsbury & Birmingham and no through booking arrangements were allowed. The goods traffic of the latter Company continued to be transferred to and from the canal at the Victoria Basin.

At the time Mr. Glyn agreed to open the line, the Shrewsbury Company's Bill for power to do so themselves and to use the North Western Station in Birmingham had already been unanimously approved by the House of Commons Committee, which fact doubtless influenced him and his advisers in no small degree. After the opening, the clauses relating to the Stour Valley were of course withdrawn; not so those for use of the Navigation Street, now New Street, Station, which passed both Houses in spite of the fiercest opposition of the owning Company.

Meantime the Shrewsbury & Birmingham's lawsuit to establish their running powers, and another, which they began later, to restrain the North Western from trying to enforce the Award for the division of the Wolverhampton Station, which Sir William Cubitt appears to have made in spite of the Shrewsbury Company's protest, were dragging on, every possible expedient for causing delay—and there were many in the old

Chancery Court of those days—being adopted by the Defendants' lawyers, who knew they had a very weak case. At last both suits came up together for final judgment by the Lords Justices on the 16th December 1852. Their Lordships declared that "it was impossible to maintain that there had been a leasing or purchasing or amalgamating" with the Great Western, and that therefore the running powers were in full force; also that Sir William Cubitt had plainly exceeded the limits of his authority and his award was void.

After this apparently decisive victory, it may be thought that the unfortunate Shrewsbury & Birmingham Railway had at last reached its rightful southern terminus. Far from it; many means of delay remained open to an ill-conditioned opponent, sulky and spiteful in defeat. Tolls and by-laws had to be settled, engines inspected and passed, though these same engines were running daily over the joint Shrewsbury & Wellington line. Failing agreement, these matters had to be settled by arbitration; failing that, by an umpire appointed by the Board of Trade. Needless to say, no agreement could be come to, so after considerable delay arbitrators were appointed; they were of course unable to arrange a meeting for some time and at last met only to disagree. Meantime the North Western, to show the danger of Shrewsbury trains on the Stour Valley, commenced from the 1st May 1853 a half-hourly passenger service between Birmingham and Wolverhampton.

In July the Board of Trade appointed John Hawkshaw umpire to settle the matter. He held his first meeting on the 10th October! On the 30th January 1854, the last day allowed by the Court, which had been appealed to, he published his award fixing the *maximum*

tolls possible both on passengers and goods, and a heavy rent for the use of the North Western Station.

The Shrewsbury & Birmingham Company protested against this as illegal, the special Act having provided for *reasonable* tolls, but in their anxiety to get to Birmingham accepted it without prejudice, and their passenger trains at last began to run over the Stour Valley Railway into New Street Station on the 4th February 1854, more than a year after their victory in the Courts and nineteen months after the opening of the line. From New Street a service of omnibuses took through passengers to the Great Western Station at Snow Hill.

At the end of May the Court of Chancery set aside Hawkshaw's Award and refused to refer the matter back to him, as it was pressed to do by the North Western. How the tolls were eventually settled is of little interest; the interesting point is that two engineers of the eminence of Sir William Cubitt and John Hawkshaw should have so strained their powers as arbitrators in favour of the London & North Western and against the little Shrewsbury & Birmingham as to have their awards declared illegal and void by the Courts.

The Wolverhampton Station dispute was settled by the adoption of an arrangement proposed by the Shrewsbury that each Company should have its separate goods station, the North Western on the south-east and they themselves on the north-west of the passenger station, which remained common to both.

This concludes the story of the fighting in the south. In the north we left the Birkenhead Company at the end of 1851 on friendly terms with the Associated Companies, having agreed to lease its line to them with a view to ultimate amalgamation. A Bill to authorise this was

accordingly deposited for the 1852 Session of Parliament. But when the formal agreement came to be settled, the Great Western maintained that the arrangement was subject to the amalgamation of the three Companies being first effected. The Birkenhead denied this, and the Shrewsbury representatives agreed with them. Saunders had to admit that the preliminary agreement was not clear on the point, through his own fault, he said ; however, it had all along been the intention of his Directors and he was obliged to insist on it. In view of the organised opposition among the shareholders of both Shrewsbury Companies, there was of course the possibility of a hitch in the amalgamation, and the Great Western could not undertake a guarantee to a line which in that event would be 70 miles off. On the other hand the Birkenhead would in the same event be left alone to the tender mercies of Captain Huish. The Chairman of the Birkenhead, whose personal sympathies were notoriously North Western, seized on this point as a pretext, and with some difficulty persuaded a majority of his Board to concur in breaking off the agreement. Moreover, the Captain had fairly terrified the Alderman by the magnificent bluff of promoting in this session not one but two competing lines between Chester and Birkenhead, by his own and the Chester & Holyhead Companies respectively. So the Bill for leasing the Birkenhead was withdrawn by that Company in spite of the protests of the other partners, and soon afterwards Alderman Bancroft had the satisfaction of arranging a lease of the line and the immediate handing over of its rolling stock to the London & North Western ; in consideration of which Captain Huish graciously consented to withdraw the Bills for the two competing lines, which he must have well known had

a very small chance of passing. This manœuvre was promptly squashed as *ultra vires* by an injunction obtained by a shareholder, no doubt put up by the Associated Companies; so in the following December, after much internal squabbling, another agreement was made to carry it out as soon as power had been obtained from Parliament. A Bill for the purpose introduced in the 1853 Session was stopped for reasons affecting all railway bills for amalgamations or leases, and on being again brought forward in 1854 was ignominiously and unanimously thrown out by the Commons Committee as soon as the promoters had closed their case, without the opposition being called upon.

The Bill for the amalgamation of the three Associated Companies passed the House of Commons with flying colours in 1852 after a bitter fight in Committee, but was stopped by the Wharncliffe Standing Order of the House of Lords, which at that time required the approval of any such Bill by a majority of four-fifths of the shareholders present at a Special Meeting. The Euston Troupe were strong enough to prevent this being obtained at either of the Shrewsbury Meetings, and so the Bill was killed for that Session. Another Bill for the amalgamation of the two Shrewsbury Companies alone also passed the Commons only to be killed in like manner, this time by the Shrewsbury & Birmingham detachment of the same troupe. The Shrewsbury & Chester succeeded in obtaining an Act enabling them to make two branches to connect the Birkenhead, Lancashire & Cheshire Junction Line at Norton and Walton, near Warrington, with the Bridgewater Canal, and, amongst other things to employ steamers on the Mersey and the Dee.

Next year the two Amalgamation Bills were again brought in by the Associated Companies, and rival Bills for power to lease the two Shrewsbury lines by the London & North Western. At this time the House of Commons, in view chiefly of Captain Huish's all-embracing activities and especially the proposed amalgamation of the Midland Railway with the London & North Western, had appointed a Select Committee to consider the whole question of railway amalgamations, and the principles which ought to guide the House in such matters. On the recommendation of this Committee, all railway bills involving amalgamation or leasing of other lines were postponed for that Session of 1853, the above Bills of course among them.

The Great Western on their own account boldly applied for powers, irrespective of the amalgamation, to run over and use the Shrewsbury & Birmingham, Shrewsbury & Chester, Shrewsbury & Hereford, and Birkenhead, Lancashire & Cheshire Junction Railways, as well as the intervening piece of the Chester & Holyhead and the Birkenhead Docks, and for that purpose at their own expense to lay additional broad-gauge rails on those lines from Wolverhampton and Hereford to Birkenhead. The Bill was opposed by all the Companies concerned except the Shrewsbury & Birmingham—even the friendly Shrewsbury & Chester petitioned against it—and after a week's hearing was rejected by the Committee of the Commons. This was the first and only attempt to obtain power to extend the Broad Gauge north of Wolverhampton.

The London & North Western Company on their part succeeded in getting an Act for a branch from Crewe to Shrewsbury, which they opened in September 1858.

While these various proceedings were going on in Parliament, the Birkenhead Company under North Western influence and against their own interests once more declared war on their best customer, the Shrewsbury & Chester. From October 1851 the latter had been working their own traffic over the Birkenhead Railway under the Agreement then made, and continued to do so after the Birkenhead people had changed their minds and gone over to the enemy, the Associated Companies contending that the Agreement remained in force till two attempts to obtain Parliamentary sanction for it had failed. In August 1852 the Birkenhead gave notice to the Shrewsbury that from September onwards they would charge them 80 instead of 60 per cent. of the mileage receipts and half terminal charges as well; but, persisting that the Agreement was still in force, the latter continued to run, paying only the 60 per cent. Eventually the Birkenhead Company brought an action claiming not the 80 per cent., which they said had not been agreed to, but much more—the maximum tolls chargeable on the basis that the Shrewsbury Company had been exercising their statutory running powers. This came on for trial at the Summer Assizes of 1853, and resulted in the sum due being referred to arbitration. The Arbitrator, a learned barrister, decided that the maximum tolls could be exacted, and that the charges made to the London & North Western of about a quarter as much for similar traffic—for example they paid 7s. 6*d.* for a truck of cattle from Birkenhead to Chester compared with £1 8s. 0*d.*—were not an undue preference, for the comical reason that the Shrewsbury did their own haulage! Upon this, the latter ceased running over the line on the 1st December, and began handing over their traffic at Chester, much to the annoyance

of Alderman Bancroft, who complained bitterly that his Company were obliged to buy six new engines to work it and go to much other expense, all through the wickedness of the Shrewsbury & Chester Company.

The Arbitrator made his Award at the end of January 1854 of some £8,500 to the Birkenhead, and next day a new action was begun for similar tolls for the further period from July to November and the ordinary rates in December and January. The state of the Alderman's feelings may be judged by the fact that the very day the taxation of costs in the first action was completed, 2nd March, without any demand or even notice to the Shrewsbury & Chester's solicitor, who happened to be in London, writs were issued to the Sheriffs of Shropshire, Denbigh, Flint, Cheshire, and the City of Chester to levy execution. Next morning the bailiffs were in possession of all stations from Shrewsbury to "the Rossett," and in Shropshire alone property to the value of £50,000, including engines, rolling stock, and goods in the warehouses, was seized for this debt of about £9,000. The money was of course at once paid, but the bailiffs remained in possession for two days, till the evening of the 4th. The responsibility for this exhibition of spite was afterwards disputed between Alderman Bancroft and his Company's solicitor, John Buck Lloyd of Liverpool, but there can be no doubt the latter had his instructions.

These proceedings were of course foolish and short-sighted. They led to Parliament granting further powers over the Birkenhead Railway to the Shrewsbury & Chester in the 1854 Session, and to the Birkenhead Shareholders taking matters into their own hands by appointing a committee of investigation, which reported strongly against the Alderman's policy of favouring the

North Western and obstructing the Shrewsbury. A table in the report shows that in spite of the constant obstructions the latter had in the five years to the end of June 1854 sent 710,304 tons of goods traffic over the line, compared with 219,817 from the London & North Western and Chester & Holyhead combined. The report was adopted by a General Meeting in October, and four Directors were replaced by four members of the Committee. By this time the injured Shrewsbury & Chester Railway had become part of the Great Western.

The Shrewsbury & Hereford Railway was opened throughout to Hereford in December 1853, and the Newport, Abergavenny & Hereford a month later. The latter line being for the time in the hands of the North Western and managed by Captain Huish, it need hardly be said that none of the traffic from South Wales to Birkenhead found its way over the Shrewsbury & Chester, but was all sent round by Stafford and Crewe. This, however, did not last long. The Directors of the Newport, objecting to being dragged into the Shrewsbury fight, pluckily rebelled and soon got rid of the warlike Captain and his Company, and began to work their line themselves.

It would be tedious to attempt to describe the ructions that went on at the frequent General Meetings of the two Shrewsbury Companies. Except that neither Chairman is recorded to have again had recourse to a nightcap or the opposition to a forged seal, the proceedings of the latter continued to be very similar to those of the early part of 1851, already mentioned. Tempting offers from the London & North Western of 4 and—to the Chester—even $4\frac{1}{2}$ per cent., without however any very certain guarantee, were dangled before the shareholders

by the opposition leaders to induce them to throw over the Directors and break their Agreement with the Great Western. Whenever an important division was anticipated the Euston troupe of small capitalists, 130 strong, could be relied on to arrive, sometimes by special train, at Wolverhampton, Shrewsbury, or even Chester, in time to support by silent votes any resolution or amendment calculated to embarrass the respective Boards. However, the latter were generally ready for them with the home team of employés and others, to the extreme anger of the opposition leaders, who regarded such retaliation as most unfair. After the enemy had secured the defeat of the Amalgamation Bills of 1852, an inquiry into the matter was made by the House of Lords, when the purchase and division of shares in the two Companies and the payment of the expenses of circulars and proxies and of opposition meetings were admitted and defended by the solicitor and other agents of the North Western. This and other evidence of the misuse of the Wharnccliffe Standing Order, originally intended for the protection of genuine minorities, led to its being modified so as to prevent such practices as far as possible.

The Directors and the majority of the Proprietors of both Companies loyally stood by the Agreements with the Great Western, which at their request had been altered so as to postpone the actual amalgamation to January 1860, by which time they considered their through traffic would have had more chance of being developed. But in August 1853, after the adoption by the House of Commons of the resolutions of Mr. Cardwell's Committee on the subject of railway amalgamations in general, the Great Western Chairman made a new proposal for immediate amalgamation, as soon as the necessary Act

of Parliament could be obtained, with a guarantee from the 1st January 1854 of certain proportions in successive years of the Great Western dividend. In the following month this guarantee was altered to a fixed $3\frac{1}{2}$ per cent. from the same date, and half surplus profits. Upon this all honest opposition suddenly collapsed, and the Euston troupe, unable to perform without leaders, was kept to its ordinary duties at home. Consequently the new terms were accepted by enormous majorities at the meetings of both Companies held in September, and peace reigned at last in their councils.

A third Bill for effecting the amalgamation of the three Associated Companies was accordingly introduced for the Session of 1854. It was opposed, of course fiercely by the London & North Western and its subsidiary Companies the Chester & Holyhead and Shropshire Union, also by the Oxford, Worcester & Wolverhampton, the Birkenhead, Lancashire & Cheshire Junction, and the Newport, Abergavenny & Hereford, which last had not yet got rid of Captain Huish. The opposition called no witnesses but relied solely on their Counsels' eloquence and powers of invective. After only five days' hearing the House of Commons Committee unanimously passed the Bill, and made a special report to the House, in view of the Cardwell Resolutions against amalgamations in general, that they had decided on recommending this amalgamation "as being of a special character and of great importance to the public interest." Wonderful to relate, at the Wharncliffe Meetings of the two Shrewsbury Companies in June, the Bill was unanimously approved.

The Bill came before the Lords' Committee early in July to encounter a last and even more desperate attack, in spite of which the Committee decided on the seventh

day that the preamble had been duly proved. Two more days were then taken up in settling the clauses. Although the Bill contained no provision for extending the Broad Gauge, the prospect of this, which always seems to have inspired terror in North Western minds, was much dwelt on by their Counsel. An attempt to extend it to Birkenhead had been made the year before, and Saunders admitted in his evidence that the Company would probably find it necessary in the course of a year or two to come to Parliament again for the necessary powers. To allay these fears as far as possible, the Great Western agreed that they would make no such application till the Board of Trade should have reported that the extension of Broad Gauge north of Wolverhampton was desirable in the interests of the public. They also agreed to become bound under penalties to complete the Narrow Gauge from Oxford to Basingstoke within eighteen months of the passing of the Act, and afterwards *to work it* in connection with the London & South Western, their own Birmingham and Chester line, and other narrow-gauge railways. Clauses to effect these objects were accordingly inserted in the Bill. With scarcely an exception the various objectionable clauses proposed by the opponents were rejected, but the North Western exhibited another of those displays of temper, without which that Company in the days of Captain Huish seems never to have been able to accept defeat. The guarantee of $3\frac{1}{2}$ per cent. to the Shrewsbury shareholders began from the 1st January 1854, and owing to the treatment those Companies had received there was of course a big deficiency in their current revenue. To obviate this loss falling at once solely on Great Western receipts, the Bill provided that for the first two years the deficiency

might be met temporarily by advances out of capital, to be repaid within the next seven years. This arrangement was sanctioned by the House of Commons but rejected by the Lords' Committee on North Western opposition, and the Bill eventually received the Royal Assent on the 7th August without it. Thus the London & North Western succeeded in injuring the Great



WREXHAM STATION, *c.* 1870

Western shareholders in their purely domestic affairs without any possible benefit to themselves.

The Amalgamation Act came into force on the 1st September 1854, putting an end to the stormy existence of the plucky little Shrewsbury & Birmingham and Shrewsbury & Chester Railway Companies, and extending the Great Western to the City of Chester, with running powers to Birkenhead and the prospect of early access to Manchester. It is pleasant to be able to record, by way of

a change, that when the failure of McClean's bridges delayed the opening of the Great Western Line to Wolverhampton till November, the North Western Authorities allowed the Shrewsbury trains to continue running over the Stour Valley into New Street Station during the interval, although the statutory running powers expired on the day the Amalgamation took effect.

The two Shrewsbury Railways were of the usual narrow-gauge type of the period with rather light permanent way on cross sleepers. During the next ten years the whole of the Chester line was relaid with heavier materials, but on the Birmingham the substitution of fish-plates for joint-chairs seems to have been all that was necessary. Signals were of the ordinary semaphore pattern, a double-armed one for both roads somewhere on the station platform, and auxiliary signals about a quarter of a mile out in each direction. The telegraph was installed throughout both lines in 1852.

Of their internal economy there is not much to be said. Both Companies seem to have been fairly well provided with engines and rolling stock; the Chester, besides its traffic over the Birkenhead Railway, was able to work the Shrewsbury & Hereford from its first opening to Ludlow until Mr. Brassey was ready to do so, and also to assist the Newport, Abergavenny & Hereford with locomotive power for a short time. Even before the opening of the Shrewsbury & Birmingham Line mutual arrangements for working through traffic were made between it and the Shrewsbury & Chester, and soon afterwards a Joint Committee for managing this was formed of representatives of both Boards. In 1851 this Committee was merged in a larger one with Great Western representatives, and a young Scotsman named James

Grierson was appointed Secretary. Early in 1854 Grierson became Traffic Manager of both lines in succession to Captain Coddington, who had succeeded Dudley Parsons in 1852 on the latter's secession to the London & North Western.

The passenger train service was of the ordinary type, save that third-class passengers were catered for to an extent quite unusual in those days; in fact, the Shrewsbury Companies seem to have been pioneers in encouraging this traffic. Queen Victoria patronised their route on the 12th October 1852 with Prince Albert and the Prince of Wales on her return from a visit of inspection to the new Britannia Tubular Bridge over the Menai Straits, which she made on her way from Balmoral to Windsor. The Royal Train did not enter Chester, but was taken on from Saltney Junction by Shrewsbury engines to Wolverhampton, where it was handed over to the London & North Western for conveyance over the Stour Valley Line. The three engines used on this occasion, one as pilot, were christened *Queen*, *Victoria and Albert*, and *Prince of Wales*; of these, *Queen* belonged to the Birmingham, the others to the Chester Company.

The engines of each Company seem from the first to have worked indiscriminately over both lines. Edward Jeffreys was Locomotive Superintendent of the Shrewsbury & Chester with head-quarters at Shrewsbury and workshops at Saltney till April 1853, when he was succeeded by Joseph Armstrong. The Shrewsbury & Birmingham engines, though the property of the Company, were worked by contractors, Messrs. Johnson and Kinder, with William Marlow as Superintendent till the same date, when the contract was terminated and the Hon. Edmund Petre became the Company's Locomotive

Superintendent for a year, after which he went to the North British and Armstrong took charge of the united stock of the two Companies. The Shrewsbury & Birmingham head-quarters and repair shops were at Wolverhampton, High Level.

William Ormsby Gore, M.P. of Parkington near Oswestry, was the first Chairman of both Companies, as well as of the Shrewsbury & Hereford; indeed he may be regarded as the father of railways in Shropshire. He became Chairman of the Joint Traffic Committee in 1850, and was succeeded on the Chester by William Wardell of that city, who gave place in 1852 to John Williams, also of Chester. On the Birmingham the Hon. Robert Clive, M.P., succeeded him in October 1851; and on the latter's death in 1853 Lord Bateman became the last Chairman.

The most active Directors and objects of the special hatred of the North Western party were Robert Roy of the Chester and George Knox of the Birmingham, each of whom had been the first Secretary of his Company. In this office Roy was succeeded first by W. S. Darkin and then by John Nicholl. Knox's successors were J. F. Nicoll, Thomas Hall, and J. F. Kirshaw.

It need hardly be said that the two Shrewsbury Companies were never exactly prosperous! Captain Huish's persecution made sure of that. The Chester did indeed pay its preference dividends and occasionally one per cent. on its ordinary stock, but the Birmingham never even succeeded in paying its preference shareholders in full.

CHAPTER IX

HARD TIMES

Wilts & Somerset—Hereford—Resignation and Death of Russell—Investigation Committee—Ruabon Coal Company—Saunders—Salisbury—Yeovil—Narrow Gauge Oxford to Basingstoke—Birkenhead—Weymouth—Bradford—Falling Dividends—Opposition—Ponsonby the Peacemaker—Narrow Gauge at Reading—Brentford—Death of Brunel—Birkenhead Railway—West Midland Railway—Agreement to Amalgamate—Narrow Gauge to Paddington—South Wales Railway taken over—Shrewsbury & Hereford Railway—Sundry Extensions—Metropolitan and West London Railways—Fight with the London & South Western—Another Peace Treaty—West Midland and South Wales Amalgamation—New Directors—Resignation and Death of Saunders.

FOR the holders of Great Western ordinary stock at this time the Company's northern conquests were indeed Pyrrhic victories. Not only had the interest on more than six millions, the cost of the extension from Oxford to Birmingham and Wolverhampton, which had been raised by debentures and preference stock, to come out of current revenue before they got a penny, but the guaranteed $3\frac{1}{2}$ per cent. to the Shrewsbury shareholders had to be provided for. Owing to the cut-throat competition to which the two Shrewsbury Companies had been subjected by Captain Huish, there was a considerable deficiency in their receipts which would have to be made up by the Great Western. This had of course been foreseen and provision made in the Amalgamation Bill for spreading the liability over several years, but, as we have seen, this was defeated by the spiteful opposition of

the vanquished enemy. Consequently the guarantee had to be met out of current revenue, and as it began from the 1st January 1854 the Great Western shareholders were hit hard before they had even got possession of the Shrewsbury Railways, and their dividend for the half year reduced from the usual 2 to $1\frac{1}{2}$ per cent., although the net revenue from their own line showed a satisfactory increase.

Another liability hanging over the Company was the completion of the Wilts, Somerset & Weymouth Railway of 1845, which had been taken over in 1850. This was open from Thingley Junction, between Chippenham and Corsham, to Frome and Warminster, and, although nearly a million and a half had already been spent on these lines and unfinished works disfiguring the country here and there all the way to Weymouth and Salisbury, the only portion the Directors had expressed any intention of completing was the Radstock coal branch. Local agitation consequently sprang up, and committees were formed in 1852 to induce the Company to proceed with their undertaking. The Directors proving deaf to their appeals, legal proceedings were taken for writs of Mandamus to compel them to complete the unfinished portions, and petitions were presented in Parliament. The Mayor of Salisbury also gave evidence of the general complaints of the district before the Cardwell Committee of 1853, alleging that the Company would not make the line from Warminster to Salisbury because it suited them better to carry passengers between Bristol and Southampton or Portsmouth round by Reading and Basingstoke, as they were doing. The lawsuits were successfully defeated, except as regards the branch from Bradford to Bathampton, for the completion of which the Mandamus was

made absolute by the Queen's Bench in Michaelmas Term 1853, after a trial at the Somerset Assizes. This the Directors seem to have intended to abandon altogether, so they forthwith appealed against the order, but the Exchequer Chamber decided in November that owing to the terms of the Act of 1845 the Company could be compelled to make the branch, and so dismissed the appeal.

Upon this the Directors, who had already recommenced some work on the Weymouth line, reconsidered the whole case and decided to promote a Bill for an extension of time and new powers to complete the Bathampton branch, the line from Frome to Weymouth, the Devizes branch, and the line to Salisbury. This Bill in due course became an Act of Parliament on the 31st July 1854, giving the needful powers and providing for the suspension of the Great Western dividends if the lines were not completed and opened within two years, or such further period as the Board of Trade might allow. The Act also enforced a curious agreement made with the London & South Western that, on condition they laid the Broad Gauge on their Southampton and Dorchester line for eight miles eastward from Dorchester, the Great Western would lay the Narrow Gauge on the $6\frac{1}{2}$ miles between the junction there and the Weymouth Terminus, and gave each Company reciprocal running powers over these mixed-gauge sections. The importance to the South Western of access to Weymouth is obvious, but what possible use running powers to a point somewhere about half-way between the country stations of Moreton and Wool could be to the Great Western seems indeed an unfathomable mystery. Needless to say, they were never exercised. Surely the extra rails cannot have been insisted on merely to annoy!

This same Act empowered the Company to make a loop line a mile west of Reading to connect the main line from the north and west with the Berks & Hants branch to Basingstoke and Hungerford. The loop was to be mixed-gauge and form part of the narrow-gauge communication between Wolverhampton and Basingstoke, which the Company were now bound under penalties to complete within eighteen months.

On the 1st September the Shrewsbury & Birmingham and Shrewsbury & Chester Railways became part of the Great Western, adding some 85 miles of narrow-gauge line, $10\frac{1}{2}$ of which were joint with the London & North Western, to the system. Owing to the difference of gauge, signals, and other arrangements, they remained for some years an almost foreign section, known as the "Northern Division." For the first two months indeed they were quite isolated till the Wolverhampton line was opened in mid November.

Three representatives of each Company joined the Great Western Board, increasing its number to eighteen, and introducing a new feature in its composition in the shape of a Director appointed not by the shareholders but by the owner of Wynnstay near Ruabon in Denbighshire. Hitherto that gentleman, Sir Watkin Williams-Wynn, Bart., M.P., had been content to appoint his steward or some other representative to the Shrewsbury & Chester Board, but soon after the right had been extended to the Great Western he appointed himself, as he and his successor continued to do almost without intermission till the Railways Act of 1921 abolished all such rights. On the London & North Western the Duke of Sutherland, as owner of Trentham in Staffordshire, possessed a similar power.

The ruinous rate-cutting competition which Captain Huish had instituted in 1849 with the sole object of crushing the Shrewsbury Companies, and by which his own Company had lost quite a lot of money, went on till the end of the year, when it was at last terminated by an Agreement between the Great Western and London & North Western Companies to charge equal and remunerative fares and rates for all traffic between all competing points, with special provisions to prevent the special rates, discounts, allowances, and rebooking tricks, for which the Captain was notorious; in fact, the very terms Saunders had proposed in 1852, which were then contemptuously rejected. This of course also put an end to similar rate-cutting between Leamington and Birmingham and several other places where the two Companies came into contact.

Early in 1855 it became necessary to raise £1,325,000 more capital for the completion of the Wilts & Somerset lines, the Reading Loop, and the addition of narrow-gauge rails between Oxford and Basingstoke. Owing to the Crimean War and the general financial situation this had to be done by the issue of 5 per cent. preference stock, to the further detriment of the ordinary shareholders, who had received only 3 per cent. for the year just past, and were not to see even that meagre sum again for six years.

The Hereford, Ross & Gloucester Railway was completed to Hereford and opened by the Great Western, who had agreed to work it for 60 per cent. of the receipts, on the 1st June. It was a broad-gauge single line, 22½ miles long from Grange Court Junction, of which the first 5 miles to Hopesbrook had already been open for nearly two years. The works were heavy, consisting on

most of the line of a series of embankments and cuttings, following closely on each other and attaining a height of 40 feet and a depth of 72 feet respectively. There were four tunnels—Lea 771, Fawley 540, Ballingham 1210, and Dinedor 110 yards long—and four viaducts over the Wye, each of timber on stone piers with six openings all of 44 feet span. The permanent way consisted of Barlow rails weighing 90 lbs. to the yard in 20 feet lengths with iron ties at the ends of each rail to preserve the gauge. A new station was opened at Grange Court, and intermediate stations at Longhope, which superseded the temporary Hopesbrook terminus, Mitcheldean Road, Ross, Fawley, and Holme Lacy. The station at Barr's Court, Hereford, as yet far from complete, was a joint one with the Shrewsbury & Hereford Company, provision being made at the south end for the broad- and at the north end for the narrow-gauge traffic. The single line was worked by telegraph from the first, with Ross as the only crossing station.

Charles Russell's long tenure of the Great Western Chair came to an end on the 2nd of August. He had told the subscribers to "The Picture" more than three years ago that the time would soon come when he must retire from active life, and twice since then had his colleagues, with some difficulty, persuaded him to continue in office. Now increasing ill-health and age—he was in his seventieth year—compelled him to resign. During the sixteen years of his reign the foundations of the Great Western system of modern times were laid and its territory marked out. From a mere railway from London to Bristol the undertaking had been extended to embrace first Cheltenham and Oxford, then Weymouth, Birmingham, and Chester, with running powers to the Mersey,

and by its daughter Company the whole coast of South Wales to Milford Haven; while its trains ran through over the lines of its allies to Plymouth, whence the jointly leased Cornwall Railway would ere long carry them on to Truro and Falmouth. It is not surprising that such rapid growth had somewhat exhausted the Company and that the shareholders of those days had to pay for it in the shape of sadly diminished dividends. They had only themselves to blame; in the wild years of the Mania and excitement of the Gauge War they had encouraged—indeed many of them had urged—the Board to undertake extensions both north and south of the original line. Moreover, Russell and his colleagues had to choose between going north of Oxford, which they were at first very loath to do, or abandoning all that district to the London & Birmingham Company, with the certainty of a rival line to Cheltenham, giving future narrow-gauge access to the whole of South Wales, and the almost equal certainty of narrow-gauge communication from Oxford to the London & South Western cutting across their original district from north to south. Once north of Oxford there was really no place to stop at, save Birmingham or Rugby, and they were invited to Birmingham by the Grand Junction Company. The Wolverhampton line followed naturally as a feeder, and the completion of both these lines was “strongly recommended” by the independent Committee of Consultation appointed by the Proprietors in 1849, who also recommended “such arrangements with other Companies north of Wolverhampton, as may produce the greatest possible traffic by this route.” Hence, in accepting the overtures of the two Shrewsbury Companies at the end of 1850 for traffic arrangements, the Board were only carrying out this

express recommendation. The subsequent agreement for absolute amalgamation was unanimously approved by the Great Western shareholders, as was also the onerous $3\frac{1}{2}$ per cent. guarantee to those Companies. So the shareholders had no right to complain of the progressive policy adopted by Russell and his colleagues, though they paid dearly for it at the time. While he occupied the Chair, he invariably carried the Meetings with him and received loyal and general support; that this was chiefly due to his influence and personality is suggested by the fact that opposition and dissensions in the Company broke out almost immediately after he had gone. We have already had evidence of the respect and affection with which he was regarded by the Great Western staff, high and low. Altogether he was a great Chairman, worthy of the great Railway he did so much to found. Of Brunel and the Broad Gauge he was of course the foremost champion in Parliament and before the world at large. It is sad to record that within a year of his resignation his illness affected his brain and like his predecessor, Sims, he died by his own hand—on the 15th May 1856.

Russell was temporarily succeeded by the Right Hon. Spencer Horatio Walpole, M.P., a lawyer politician, who had been Home Secretary in Lord Derby's short-lived Government of 1852 and joined the Great Western Board in the following year. He now agreed to take the Chair during the interval of the Parliamentary recess till the following February.

The first act of the new Chairman was to suggest the appointment of a committee of the Board to investigate the financial position of the Company and its general condition and prospects. A Committee of seven was

accordingly formed, consisting of himself, Russell, Lord Barrington, two of the Directors appointed by the Proprietors in 1849, and a representative of each of the late Shrewsbury Companies.

After an exhaustive investigation this Committee made a lengthy Report in January 1856, which was at once printed and circulated to the Shareholders. Among many other things, it shows that the capital of the Company, excluding the two Shrewsbury Lines, was then in round figures £23,500,000, of which only £8,300,000 consisted of ordinary stock, £4,900,000 of preference, and no less than £10,300,000 of debentures and loans at various rates of interest. This huge floating debt, besides being a heavy burden on the revenue, was a frequent cause of anxiety to the Board. Some four millions of it could be paid off at any favourable opportunity by the issue of stock and the sale of the shares held to the extent of £1,800,000 in other Companies, and power had been obtained from Parliament in 1853 to convert the remainder into 4 per cent. debenture stock; but no opportunity of taking either of these courses on reasonable terms had yet occurred. Of this capital, while £10,760,000 had been spent on the 216 miles of the Company's own lines open in 1849, the 82 miles of new railways connecting the Oxford Branch with the Shrewsbury & Birmingham north of Wolverhampton had cost £6,335,000, and £1,433,000 had already been spent on the Wilts, Somerset & Weymouth, of which only $31\frac{1}{2}$ miles were open for traffic, £750,000 of this on land and works of the unfinished portions beyond Frome and Warminster; Paddington Station accounted for over £480,000, including £59,500 for the Hotel. The capital of the two Shrewsbury Railways was just over £3,000,000;

£1,800,000 whereof consisted of ordinary stock, £775,000 of debentures, and the rest of preference shares, mostly at 8 per cent.

The internal administration of the Company's business the Committee found generally satisfactory. Of the Engineering and Locomotive Departments and the establishment generally, they have not much to say. Since 1853, when a new arrangement had been made with Brunel, a permanent Engineering Establishment had been located at Paddington under his general superintendence—he had of course much work on hand for other Companies.

The annual increase in the traffic receipts was satisfactory and encouraging, especially as regards goods traffic, which had doubled itself in the five years since 1851. It was, however, still little more than half that from passenger traffic, the actual figures for 1855 being £436,394 and £848,880 respectively. This the Committee attributed “to the fact that the Great Western Railway until recently had been principally dependent for its traffic on agricultural districts, and, with the exception of Bristol, had not any extensive communications with commercial towns.” They anticipated that the goods and mineral traffic would soon greatly increase. At this time the Goods Management was divided between three independent officers with co-ordinate authority: A. J. Drewe in the south, J. S. Forbes in the west, and W. L. Newcombe in the north. The last named, previously Goods Manager of the York, Newcastle & Berwick, now part of the newly formed North Eastern Railway, had been specially engaged at the beginning of 1855 to manage the new northern goods business. The Committee recommended that Newcombe should forthwith be appointed Chief

Goods Manager for the whole system, and that "a thoroughly competent and intelligent person" under him should be placed in the north to carry out the arrangements he had already made. The person chosen, when the Board adopted this recommendation soon afterwards, was James Grierson, a young man of twenty-eight, who had been successively Secretary to the Through Traffic Committee of the two Shrewsbury Companies from December 1851, Traffic Manager of those Railways from March 1854, and local Goods Manager at Wolverhampton from February 1855. When Newcombe resigned in September 1857 to become General Manager of the Midland Railway, Grierson succeeded him as Chief Goods Manager at Paddington, while still under thirty years of age.

The Committee summed up their views on the Company's prospects as follows:

To estimate fairly the real state and condition of the Company, they must look as much to its future prospects, founded on a calm and dispassionate view of its liabilities on the one hand and its expectations on the other, as to the actual circumstances which have recently depressed the undertaking. In doing this, there is good ground for encouragement. The improvement in the traffic of the Shrewsbury Lines exhibits during the last half year an average increase of £1,000 a week. The improvement in the traffic of the Great Western Lines exhibits during the same period an average increase of £3,000 a week. The Goods traffic with the North is only just about to commence. The Mineral traffic both of South Wales and Somersetshire, as well as of North Wales, is susceptible of large increase. The growing receipts of the general traffic, whether it be of Passengers or of Goods, is so uniformly diffused over all parts of the Line that, if all outstanding liabilities were now closed, the Committee would feel confident that the condition of the Company not only would not be worse but, as far as they are capable of judging, would steadily grow better. At the same time it ought not to be disguised that their liabilities are still large, and they must therefore be anticipated by every precaution which prudence can devise. During the

current half year indeed they will not be felt to their full extent; but it may be anticipated with confidence that increasing receipts will balance them. In the next half year, most of the remaining liabilities will fall upon current revenue, because by that time the Wilts, Somerset, & Weymouth Line, as well as the Uxbridge and Henley Branches will be opened. The extent of new revenue to be derived from these sources will depend on the condition of the country, the activity of trade, and the influences which a state of peace or war may bring to bear upon the amount of traffic.

Evidently the Committee did not expect much from the completion of the Wilts & Somerset, especially now that a rival line between Salisbury and Yeovil had been authorised and was under construction. Reading between the lines of the report, it is clear that they took a somewhat gloomy view of general Great Western prospects for the immediate future.

Shortly before the issue of this report a bombshell was dropped among the shareholders by the publication of a circular letter from the two 1849 Directors on the Committee, Samuel Baker of Worcester and Richard Potter of Gloucester, attacking the Board and their administration of the Company's affairs. Their complaint was that the Board persisted in refusing to appoint committees to supervise the different departments, or to divide the offices of Secretary and General Superintendent, both of which changes they had proposed as early as 1851, and that more work was therefore imposed on Saunders than he was capable of doing. The recent Committee of Investigation had, they said, suggested the formation of a Traffic Committee, but even this was negated by the Board. While both admitted Saunders' great ability and wholehearted devotion to the Company, they strongly urged that he should be relieved, without any reduction of salary, of the office of General Superintendent, and that a General Manager should be appointed,

in conformity with the practice of nearly all other Railway Companies. Potter went so far as to allege that external relations with other Companies and the conduct of the goods traffic were injuriously affected by "the peculiar organisation of the Board and the anomalous position of the Secretary," who, he considered, had too much authority, owing to the lack of Departmental Committees. Being unable to induce their colleagues to agree with them, Messrs. Baker and Potter announced their intention of resigning their seats at the Board, which they did after further expounding their views to the Shareholders at the February General Meeting without much effect.

At this Meeting there was a great deal of opposition and criticism owing to the dividend having fallen from 3 to $2\frac{1}{2}$ per cent. and especially over the formation of the Ruabon Coal Company, which the Directors announced in their Report. This undertaking originated in the desire to get a large regular coal traffic on the line. At first the Directors, acting on Gooch's advice, had proposed that the Great Western should acquire a colliery near Ruabon belonging to Mr. Henry Robertson, with the view of bringing coal to London and other stations and selling it, but finding that such action would be beyond the Company's powers, the Chairman suggested to Gooch that he should form a limited company to buy the colliery and agree to send a large quantity of coal over the railway. The Ruabon Coal Company, consisting chiefly of Great Western officers and their friends with Gooch as Chairman, was the result. Before making the proposed agreement with the new Company, however, the Directors, anticipating opposition and accusations of undue preference from rival interests in the coal trade, decided to ask

for the express approval of their Proprietors. Having got this by a large majority at the Meeting, they afterwards made an agreement with the Coal Company for ten years from January 1857, whereby the latter undertook to send sufficient coal over the railway for more than 100 miles to produce a gross revenue of at least £40,000 a year, to be doubled after two years in certain events; in return for which the Great Western were to charge only agreed rates and afford various facilities, including the transfer from narrow- to broad-gauge trucks at the nominal charge of 1*d.* a ton. This agreement was a stock bone of contention between certain shareholders, who considered their private interests in other collieries were affected by it, and the Board at all the Half-yearly Meetings till at last in November 1858 judgment was given in a Chancery suit brought by a coalowner of Lydney that it was perfectly legal and created no undue preference. It is satisfactory to learn from Gooch's *Reminiscences* that the colliery turned out a very good investment and brought profit to both parties to the arrangement.

The term for which Walpole had agreed to occupy the Great Western Chair coming to an end with this February Meeting, Viscount Barrington, who had been Deputy Chairman since 1843, was elected Chairman, with Walpole as his Deputy, but on the latter declining this post Mr. John William Miles of Bristol accepted it.

The immediate effect of Messrs. Baker and Potter's attack on Saunders, or rather on his dual office, for they made no attack on him personally, was a spontaneous outburst of loyalty and affection on the part of the Great Western staff. In a very short time some £400 was subscribed by about the same number of the officers and principal clerks. This sum was invested in a large silver

centre-piece for the table and a pair of claret jugs, which were presented at a crowded gathering in the Paddington Board Room on the 19th April 1856. In the course of his speech Saunders referred to the assertions of the two ex-Directors and expressly denied that he had ever interfered with the duties of the heads of departments or interposed between them and the Board, or taken on himself exclusively the management of the Company. As to this, he said: "When I was asked some years ago whether I could undertake it I said it was impossible, and that all I could venture upon, in the position of a superior officer and as the organ of the Board, was to superintend the executive administration, and assist as far as possible those who had the management of affairs placed in their hands; and I have sedulously endeavoured to do so much and nothing more." This view of his duties accords with a statement made in December 1854 by Russell himself, than whom no one could be better informed, that the title General Superintendent had been purposely chosen rather than that of General Manager, because the Board intended to retain the entire management in their own hands, and Saunders was to act only as their mouthpiece and superintend the carrying out of their orders by the various chief officers, all of whom had direct access to the Board.

Several extensions were completed in 1856, the first being the little Abingdon Railway, which the Company had undertaken to work, opened on the 2nd June. This was a broad-gauge single line, constructed in less than a year by a local Company,¹ not quite two miles long from

¹ The Abingdon Railway Company maintained a prosperous existence till 1904, when the shareholders got £20 Great Western ordinary stock for each £10 share.

that town to a junction with the Oxford Branch a quarter of a mile north of the Thames Bridge at Nuneham, where platforms to enable passengers to change trains were erected. Abingdon Junction, as these were entitled, was never a station in the ordinary sense of the word and did not appear in the public time-tables; like Kemble on the Gloucester Line in its early days, it was merely a changing place.¹

On the last day of this same June the Salisbury Branch was completed by the opening of the remaining $19\frac{1}{2}$ miles from Warminster. Like the section between Westbury and Warminster, this was a single line with no engineering works of special interest. Intermediate stations were established at Heytesbury, Codford, Wiley [*sic*], Langford,² Wishford, and Wilton, of which Wiley alone was a crossing station. The whole branch from Westbury was worked by single-needle telegraph from the first. The original terminus at Salisbury is still in use, one of the few remaining examples of Brunel's usual type of all-over roofed stations. It was somewhat damaged when only three months old by a cattle train with two engines, which did their best to run through it and out on to the road beyond, at the cost of the lives of two of the four men on the engines, none of whom had been over the new line before, and 108 sheep.³ At this time the South Western Company's station was at Milford, a mile away on the other side of the city, to the great inconvenience of passengers for Southampton and Portsmouth. More than three years elapsed before their new station, adjoin-

¹ Superseded by a new station at Radley, $\frac{3}{4}$ mile north, in 1873, the branch being prolonged beside the main line.

² $1\frac{1}{4}$ miles beyond Wiley; abolished in October 1857.

³ On the 6th October 1856.

ing the broad-gauge terminus, was opened with the Salisbury & Yeovil Railway, whereupon the Great Western provided a transfer shed and sidings for the transshipment of goods, which were brought into use in the summer of 1860.

A further 26 miles of the main Wilts, Somerset & Weymouth Line, from Frome to Yeovil, were opened for traffic on the 1st September. Though all the works had been made wide enough for two lines only one was laid, to be worked by telegraph like the Salisbury Branch. The new stations were Witham, Bruton, Castle Cary, Sparkford, Marston, and Yeovil, Pen Mill, to which the Bristol & Exeter Company were extending their Durston-Yeovil Branch from their station at Hendford on the other side of the town; there were crossing loops at all these places except Marston.

A week later the branch from West Drayton to Uxbridge, $2\frac{1}{2}$ miles more of single line, was opened.

Finally, at the end of the year, the narrow-gauge rails between Oxford and Basingstoke, promised by the Board in 1846 and made compulsory by the Shrewsbury Amalgamation Act to provide through communication between the railways north of Wolverhampton and the London & South Western, were completed, and used for the first time by a narrow-gauge goods and coal train on the 22nd December. The Avoiding Line at Didcot, to which the Mixed Gauge was confined, no additional rails being laid through the station there, and the western loop near Reading, also mixed-gauge, were opened at the same time. After this, narrow-gauge goods trains gradually became a common sight between Birmingham and Basingstoke, where they had hitherto been unknown, for though the third rails had

been in existence as far as Oxford for more than four years no regular trains, either for goods or passengers, seem to have used them till this extension. Between Wolverhampton and Birmingham trains of both gauges had been run indiscriminately from the opening of that line.

In the north, Great Western goods trains had been running to Birkenhead since the 2nd February. Relations with the Birkenhead Company had undergone several changes since the Shrewsbury Amalgamation. At that time, as we have seen, the Shrewsbury & Chester had ceased exercising its running powers over the line, and the Birkenhead Board, under the influence of Alderman Bancroft, had agreed to lease the railway to the London & North Western. Power to do this having been refused by Parliament, and a committee of investigation having reported strongly against the Alderman's policy of hostility to their best customer in the interests of another Company, and in favour of an agreement with the Great Western, the shareholders adopted their report at a General Meeting in October 1854 and elected four new Directors. The altered Board then concluded a working agreement with the Great Western with an option to lease the Birkenhead Railway in perpetuity, but this was defeated by North Western influence at the Half-yearly Meeting in February, and the Company's policy once more became hostile.

In August 1855 the Great Western Directors reported :

It has been a disappointment to find that some obstruction, similar to that previously complained of, has been continued to the traffic of the two Shrewsbury Railways passing over the Birkenhead Lines, in spite of the assurances given by their late Chairman to the contrary, and notwithstanding the efforts perseveringly made by Directors of both Companies to overcome that state of affairs.

The consequence has been that in the absence of all facilities for transmission of traffic either to or from Liverpool or Manchester, by means of friendly co-operation and aid from the Birkenhead Company, it has been hitherto found necessary to forego the advantages of soliciting or undertaking the conveyance of that merchandize, the Directors being unable to rely with certainty that it would be properly forwarded on equitable terms or punctually and correctly delivered.

They were therefore taking steps "to procure independent premises in Birkenhead, with adequate local accommodation, both in Liverpool and at Timperley, near Manchester," and then proposed to exercise their running powers over the Birkenhead Lines. Timperley was to be reached by means of powers acquired in 1855 over the Warrington & Stockport Railway from Lower Walton, but there the powers ceased, some six miles from Manchester. In the course of the next half year the Company leased some premises and wharves in the Birkenhead Docks, and as soon as these were ready began to run their own goods trains from Chester on terms settled by arbitration. No attempt to reach Manchester via Timperley seems to have been made. At about the same time, according to the Report of February 1856, "a considerable Mineral Traffic, from the interchange of Red Ore from Birkenhead for the Iron Masters of South Wales, with Steam Coals back from that district to the River Mersey," began. This was worked throughout from Pontypool to Birkenhead by the engines and waggons of the Newport, Abergavenny & Hereford Company, under an arrangement with the three other Companies concerned—Shrewsbury & Hereford, Great Western, and Birkenhead.

Great Western passenger trains began running through to and from Birkenhead on the 1st May 1857 under an agreement with the Birkenhead Company, who by this

time had thrown off their subservience to Captain Huish and taken up the more sensible attitude of welcoming traffic over their line, no matter whence it came.

The remainder of the Wilts, Somerset & Weymouth Line was completed in 1857. First, the $27\frac{1}{2}$ miles from Yeovil to Weymouth were opened on the 20th January, as a single line to Dorchester, and thence double, with additional narrow-gauge rails from the junction with the London & South Western, beyond Dorchester Station, to Weymouth. On this there were four tunnels: Holywell, near Evershot, 311 yards; Frampton 660; Poundbury, near Dorchester, 264; and Bincombe 814, besides two of 40 and 20 yards respectively; and nine viaducts from 22 to 102 yards long of stone or timber. Stations were provided at Yetminster, Evershot, Maiden Newton, Frampton, Dorchester, and Weymouth,¹ Evershot being at first the only crossing station on the single portion; until the completion of the telegraph, which was not quite ready, this was worked by two pilotmen, one on each side of Evershot.² All the works were wide enough for a double line throughout, and much of the earth work had been executed from six to ten years previously. The permanent way consisted of the usual bridge rails, varying from 61 to 68 lbs. to the yard, on longitudinal sleepers 12 inches wide by 8 deep. At the Weymouth Terminus, another of Brunel's all-over roofed stations like Salisbury, separate platforms were provided for the narrow-gauge South Western trains, which began running on the opening day. The curve connecting the two railways at Dorchester was a mixed-gauge single line, worked by a pilotman, and the Mixed Gauge was

¹ Upwey was added in 1871.

² Between Yeovil and Evershot the line was doubled in 1858.

extended on the South Western line for the covenanted eight miles from Dorchester towards Wareham.

The branch from near Trowbridge to Bradford and Bathampton should have been opened on the same day, but the Board of Trade Inspector, Colonel Yolland,



BRADFORD-ON-AVON, 1848-1857

Station Buildings marked ×

finding the permanent way very rough, ordered it to be postponed. This having been made good, the single line, just over 9 miles long, through the Avon Valley was opened on the 2nd February. As far as Bradford, with the tunnel (159 yards) and even the station there, it had been practically ready, save for part of the permanent way, more than seven years, as we have seen. It left the main Wilts & Somerset line about $1\frac{1}{4}$ miles north of Trowbridge by a fork, on the southern branch

only of which rails were laid,¹ and joined the Great Western main line $2\frac{1}{2}$ miles east of Bath at Bathampton, where a new station was built. The intermediate stations were the same as now—Bradford, Freshford, and Limpley Stoke. The Kennet & Avon Canal was carried over the line twice, at Avoncliff by means of a timber trough on brick abutments, and at the Dundas Aqueduct over the Avon by brick arches built in cement. The latter work had caused much trouble and delay, and was described



DUNDAS AQUEDUCT

by Brunel as “a tedious and rather difficult operation.” There were seven viaducts on the branch, all of timber on piles, varying in length from 66 to 242 yards. All the works and even the ballast were wide enough for a double line. A notable feature was the permanent way, for which Brunel adopted, apparently as an experiment, the usual narrow-gauge practice of cross sleepers and chairs. About $1\frac{1}{2}$ miles at the Bradford end consisted of 61 lb. bridge rails on 14 by 7 inch longitudinals but, in Colonel Yolland’s words,

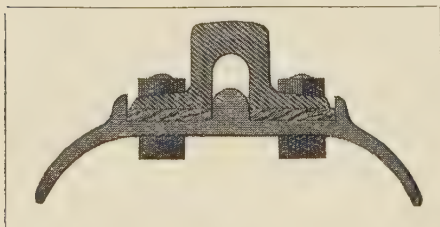
The remainder of the line is laid on transverse sleepers 12

¹ The northern curve was not used till March 1895.

feet \times 8" \times 5". The rails, of the **T** form, are fixed in cast-iron chairs weighing 28 lbs. by wooden keys, and these chairs are bolted to the transverse sleepers by fang-bolts. The sleepers are placed one yard apart. The rails average $71\frac{1}{2}$ lbs. per linear yard in lengths of 24 feet. The joints are fished.

Only the Devizes Branch now remained to finish the Wilts, Somerset & Weymouth undertaking. This had been delayed by a landslip and was not ready till the 1st July, when it was opened as a single line without either an intermediate station or even one at Holt Junction, where it joined the main line between Melksham and Trowbridge.¹ It was $8\frac{1}{4}$ miles long.

The Bridport Railway from Maiden Newton to that town was made by a local Company² and opened on the 12th November. It was a broad-gauge single line, $9\frac{1}{4}$ miles long, with one intermediate station at "Poorstock."³



SECTION OF MACDONNELL'S RAIL

On it we find yet another variety of permanent way, which Captain Tyler of the Board of Trade thus described:

It has been laid with MacDonnell's patent permanent way, consisting of bridge rails weigh-

ing 51 lbs. and longitudinal rolled iron sleepers weighing 60 lbs. to the lineal yard, which are secured to each other by screw bolts and nuts. The gauge is preserved by angle iron cross-ties, 9 feet apart; and a strip of wood has been inserted between the rails and sleepers to prevent rigidity. This description of permanent way has been

¹ Seend Station first appears in September 1858; and Holt Junction in 1861, but only as a changing place till 1874.

² Absorbed in 1901; £6 cash for each £10 share.

³ Toller was added in 1862.

already tried on the Bristol & Exeter Railway, and with such success as to induce the Company to lay down an additional portion of it.

The Bridport Railway was worked by the Great Western from the opening and afterwards leased to them.

The opening of the line to Salisbury and Weymouth necessitated considerable alteration and enlargement of the Chippenham Station, entailing the diversion of the main line there to new booking offices slightly nearer the town and the provision of an engine house and new goods shed; these were completed in the summer of 1858. The actual junction at Thingley,¹ two miles to the west, remained peculiar in having no facing points, so that trains for the branch had to stop and back into a siding before proceeding towards Melksham. Brunel had a prudent objection to facing points, especially at places away from stations where they would be passed at speed, and avoided using them wherever possible.

Yet another single line branch was opened in 1857—from Twyford to Henley on the 1st June, $4\frac{1}{2}$ miles long with a timber viaduct across the Thames and a station at Shiplake.

Altogether the Company opened just upon 100 miles of country branches of their own in the twelve months from the end of June 1856, most of them in the autumn and winter. The result was of course another blow to the already hard-hit ordinary shareholders, the traffic on such lines, dependent as it was on the local population and produce, being small at the beginning and very slow in development, and yet requiring all facilities to stimulate its growth. Moreover, two of them, the Salisbury

¹ No evidence has been found that rails were ever laid on the western curve still to be seen here. It was probably formed before the construction of the Bathampton Branch was made compulsory.

and Bathampton Branches, diverted traffic from and to the Bristol district, which had hitherto passed by Reading and Basingstoke or by Chippenham, to shorter routes, and so actually lessened the earnings of the main line.

The dividend, which had risen from $2\frac{1}{4}$ per cent. for 1855 to $2\frac{3}{4}$ for 1856, fell to $1\frac{1}{2}$ for 1857 and to $1\frac{1}{4}$, the lowest ever paid by the Company, for 1858, when a general depression of trade had increased the burden of the recent extensions. For the first half of this wretched year nothing at all was paid; and for the second only 1 per cent. was proposed by the Board, the additional quarter being insisted on by the shareholders at the Half-yearly Meeting.

The General Meetings of the Company at this period were far from peaceful. There was a strong opposition to the Directors, composed chiefly of Bristol business men and led by Mr. William Miles of Leigh Court, M.P. for East Somerset, whose object was to replace some of the country gentlemen on the Board by commercial men, or, as they put it, "to infuse a more mercantile element into the Board." Other demands were for the reinstatement of Messrs. Baker and Potter, who had recently resigned of their own accord, and the adoption of their policy of committees and a General Manager distinct from the Secretary. The Ruabon Coal contract was also a subject of much uncalled-for jealousy with shareholders interested in other collieries. At the August Meeting of 1856, held as usual at Bristol, the opposition succeeded in securing the appointment of a deputation of four to consult with the Directors as to the alteration of the Board. Failing to induce the Directors to accept any of their proposals the deputation circulated a report of their proceedings in a pamphlet of sixty pages,

which called forth a reply of fifty-four pages from an anonymous Shareholder, and Mr. Miles moved at the London Meeting of February 1857 that "the present system of management of the Great Western Railway is defective and requires amendment." This was defeated on a poll by a considerable majority, apart from the proxies which the Directors had obtained in large numbers, but the opposition was by no means quieted, and remained to be reckoned with, especially at the August Meetings in Bristol.

In May the Directors at last succeeded in finding a gentleman qualified and ready to relieve Lord Barrington from the onerous and not altogether pleasant duties of the Chair, which he had only consented to undertake for a few months on the withdrawal of Mr. Walpole. This was the Hon. Frederick George Brabazon Ponsonby, third son of the 4th Earl of Bessborough,¹ aged only forty-two, a barrister of Lincoln's Inn and famous in the cricket field. He was elected a Director in Russell's place, which had been kept vacant for the purpose, and forthwith appointed to the Chair, Lord Barrington resuming his old post of Deputy Chairman, vacated for him by Mr. John Miles.

The new Chairman was a man of peace. Now that the Great Western system had been completed and all its Parliamentary engagements fulfilled, what the Company wanted to recover prosperity was an end to fighting, both internal and external, and Ponsonby set himself to achieve it.

He began by holding out the olive branch to the Bristol opposition at his first Meeting there by a promise on

¹ He succeeded his brother as 6th Earl in 1880 while still a Great Western Director.

behalf of the Board that if three or four gentlemen of commercial pursuits, willing to give their time as Directors, could be found, vacancies should be made for them. Up to the time of the next Half-yearly Meeting in February 1858 no suitable candidates had been found either by the Directors or the Opposition; then three were proposed and accepted, one of them being the ex-Director Samuel Baker; and three Directors, including Walpole the late Chairman, resigned their seats to admit them to the Board.¹

The next August Meeting was the last held in Bristol. In February 1859 the Directors were authorised to insert a clause in the Company's Bill of that session repealing the provision in the original Act of 1835, which required the Half-yearly Meetings to be held in London and Bristol alternately, and in anticipation of its passing a Special Meeting on the 31st March decreed that all future meetings of the Company should be held in London.

Of external enemies the first with whom peace was made was the Oxford, Worcester & Wolverhampton. In this case the overtures came from the Board of that Company, which had been remodelled in 1856, but from various causes nothing was effected till February 1858, when after prolonged negotiations Ponsonby and the Oxford, Worcester & Wolverhampton Chairman signed an Agreement releasing the Company from the obligation to complete the Broad Gauge on its main line, which it had been fighting against for nearly seven years, and providing for an interchange of traffic and the establishment of improved relations in general.

Next, an Agreement was come to with the South Eastern and London & South Western Companies in June for the termination of the insane rate-cutting com-

¹ Walpole rejoined in 1859.

petition between London and Reading, which they had been engaged in against the Great Western ever since the opening of their lines in 1849 and 1856 respectively, and a pool of the receipts from which the Great Western was to have roughly two-thirds of the passenger revenue and the other two Companies between them two-thirds of that from goods, after allowing for working expenses.

Later in the year Ponsonby had the satisfaction of signing three Agreements with Lord Chandos, the London & North Western Chairman, for peaceful relations with that Company. The first of these, in July, provided for through bookings between Great Western stations and the Chester and Holyhead line; the second, in November, for an extension of the practice of equal rates and the division of traffic at all competitive places; and the third, also in November, giving Great Western traffic access to Manchester over the North Western from Walton Junction, via Warrington and the old Liverpool & Manchester Line, and the use of their Liverpool Road Goods Station there.

These last arrangements were facilitated by the entire collapse of Captain Huish's "Euston Empire"—even the faithful Midland had at last rebelled and deserted him—and the abandonment of his fighting protectionist policy by the North Western Company, from whose service the old warrior retired in September.

How far Ponsonby was himself responsible for this general policy of pacification and how much Saunders had to do with it, we shall never know. Equal rates the latter had always advocated, but it is hardly likely that, loyal admirer of Brunel and foremost champion of the Broad Gauge as he was, he approved of the surrender to the rebel Oxford, Worcester & Wolverhampton; all the same, he must have recognised that any extension of the

existing broad-gauge system, north of Oxford at any rate, was now wellnigh hopeless, and that the surrender was practically inevitable. However this may be, the Chairman, during whose short reign these various agreements were made and who put his name to them, is certainly entitled to be remembered in Great Western annals as Ponsonby the Peacemaker.

The only new railway in connection with the Great Western opened in 1858 was that of the East Somerset Company,¹ a broad-gauge single line 9 miles long from Witham Friary on the Weymouth Branch to Shepton Mallet with an intermediate station at Cranmore.² This was opened on the 9th November and worked by the Great Western. The permanent way on this line was of the usual broad-gauge type of the period—61 lb. bridge rails on longitudinal sleepers; there were no engineering works worth mention.

The Narrow Gauge made a small but important encroachment on the broad-gauge system towards the end of the year. Two Bills were introduced into Parliament in the 1857 Session with the object of connecting the South Eastern Railway at Reading with the Great Western mixed-gauge line between Basingstoke and the north, which passed within little more than a mile of the town. One of these, promoted by the South Eastern Company itself, was opposed by the Great Western and defeated; the other, by the Staines, Wokingham & Reading Company, whose line with running powers over the South Eastern into Reading was worked by the London & South Western, was assented to on certain conditions, and passed by Parliament. It authorised the Staines Company to make a railway from a junction with

¹ Absorbed in 1874.

² Wanstrow was added in 1860.

the narrow-gauge rails of the Great Western in the parish of Tilehurst to the South Eastern, provided the Great Western did not within a year make a narrow-gauge line thence to a certain point east of their Reading Station; in which case the Staines Company might only complete the connecting link from that point. Preferring to do the work themselves, the Great Western accordingly proceeded to lay a single narrow-gauge line on the north side of the main line from the junction of the Basingstoke Loop for a mile and a quarter past Reading Station and down to the ground level, curving round to pass under the main line at a very acute angle to join the Staines Company's short branch from the South Eastern Railway. This was finished within the time limited by the Act but not opened for traffic till the exchange sidings on the low level were ready in December 1858. Its completion inaugurated a new route between the midlands and north and the south-eastern ports, and through them with the Continent.

One other event remains to be recorded before we leave this year—the sale to the London & North Western of the Company's interest, as successors of the Shrewsbury & Birmingham, in the joint High Level Station at Wolverhampton and the concentration of the passenger and goods business at the Low Level Station, also joint but with the Oxford, Worcester & Wolverhampton Company, and the Victoria Basin Depot respectively. Since November 1854 both stations had been used by the Great Western for their passenger traffic northward, carriages being started from the High Level to join the trains from the new Low Level Station at Stafford Road Junction, where there was a platform.¹ This curious

¹ There was no corresponding service in the opposite direction, all passengers from the north being landed at the Low Level.

practice now ceased, and as soon as the new goods sheds and warehouses at the Victoria Basin, to replace those of the late Shrewsbury & Birmingham at the High Level Station, were ready for use in the autumn of the following year, the latter were handed over to the North Western and the connection between the two railways abolished.

Having done good work in his short term of office, Ponsonby relinquished the Chair immediately after the General Meeting of February 1859, at which he was accorded a hearty vote of thanks "for his great services to the Company since he became their Chairman." His successor was a connection by marriage, a year younger than himself, the second son and heir of the 3rd Marquis of Lansdowne, known by his father's title of Earl of Shelburne. Lord Shelburne, who sat in the House of Lords as Baron Wycombe and had been Foreign Under-Secretary in Palmerston's Government, joined the Great Western Board in the previous autumn, no doubt with a view to relieving Ponsonby.

The Great Western & Brentford Railway Company,¹ incorporated in 1855 to make a broad-gauge railway from the Great Western at Southall to the Thames at Brentford with a dock there, completed their line sufficiently to enable it to be opened for goods and mineral traffic on the 18th July. It was, of course, of great importance to the Great Western in affording direct access to the river for the considerable traffic, hitherto carried to Bull's Bridge only and thence sent in barges by the Grand Junction Canal with much delay and expense. The Company therefore agreed to lease the new line, and

¹ Absorbed in February 1872; £50 Great Western 5 per cent Preference Stock for £100 Brentford Ordinary.

transferred their hydraulic and other plant from Bull's Bridge to the new dock at Brentford. It was a double line laid out by Brunel, and within a mile of Southall passes under the Grand Junction Canal at a point where this is crossed by a road bridge. Passenger traffic began on the 1st May 1860.

In the far west the Cornwall Railway was opened from Plymouth to Truro on the 4th May 1859, and carriages could now run through over the 300 miles from Paddington, but, though that line was largely financed by the Great Western in common with the Bristol & Exeter and South Devon Companies, the event was not of sufficient importance to find mention in the Directors' Half-yearly Report; probably it made little difference to the traffic receipts.

On the 15th September Brunel died, worn out by hard work and worry at the early age of fifty-three. For more than two years his health had been failing, and latterly he had spent much time abroad in Switzerland and Egypt. Though he remained nominally the Great Western Engineer to the time of his death, his position for some years had been practically that of consultant, much as he hated the term, and the everyday work of the railway was left to his chief assistant, T. H. Bertram, as Resident Engineer.¹ It does not fall within the scope of this work to tell the story of his life and achievements; that has already been done by his son.² He was a great engineer of outstanding and original genius, too original perhaps in that he was sometimes given to trying costly experiments,

¹ The last half-yearly Report signed by Brunel is that for August 1857.

² *The Life of Isambard Kingdom Brunel, Civil Engineer* by Isambard Brunel. Longmans Green & Co., 1870.

for which the Company employing him had to pay dearly. Gooch wrote the following panegyric:¹

By his death the greatest of England's engineers was lost, the man of the greatest originality of thought and power of execution, bold in his plans but right. The commercial world thought him extravagant, but although he was so, great things are not done by those who sit down and count the cost of every thought and act. He was a true and sincere friend, a man of the highest honour, and his loss was deplored by all who had the pleasure to know him.

Bertram continued to act as Great Western Engineer till April 1860, when he retired and another of Brunel's assistants, Michael Lane, who had once been a foreman bricklayer under his father on the Thames Tunnel, was appointed "Principal Engineer." A few months before this the Board had engaged John Fowler to succeed Brunel in the capacity of "Consulting Engineer."

Negotiations were opened in May 1859 with the Birkenhead Company, which was now anxious to get rid of the working and management of its railway, and had obtained powers from Parliament to make arrangements for that purpose with the Great Western *and* London & North Western, jointly but not separately. These eventually took the form of an agreement for the absolute transfer of the Birkenhead to the two Companies from the 1st January 1860, but as this was not provided for by the Act another application to Parliament became necessary. This was made in 1860, but fell through owing to certain differences springing up between the two great Companies, the chief one being the North Western's desire to obtain the previous abandonment by the Birkenhead of its alternative running powers into Manchester over their Warrington & Stockport and South Junction Railways via Timperley, to which the Great Western naturally

¹ *Diaries of Sir Daniel Gooch*. Kegan Paul & Co., 1892.

objected. These disputes were not settled till July, when the provisional agreement was finally sealed by all three Companies. It took effect as from the previous 1st January, but, owing to the approval of the Board of Trade being required, the Great Western and North Western did not actually obtain possession of the Birkenhead Railway till the 20th November. The engines and rolling stock were then valued and divided between them, and in the following year an Act was obtained sanctioning the transfer and providing for the management of the joint line by a committee formed of three Directors of each Company with an independent Chairman.

The Birkenhead Railway consisted of the old Chester & Birkenhead Line opened as long ago as September 1840, from Chester to Grange Lane, with a single line branch to Monks Ferry added four years later, and an extension to the Docks, and also of the Birkenhead, Lancashire & Cheshire Junction Railway from Chester to Walton Junction near Warrington, opened in December 1850. The latter undertaking was originally intended and authorised in 1846 to connect the Chester & Birkenhead at Hooton and Chester with Altrincham and Stockport, but owing to the financial troubles of 1848 and 1849 it was cut down to a line from Chester to a junction with the North Western main line at Walton, with running powers thence to Manchester. The Chester & Birkenhead and Birkenhead, Lancashire & Cheshire Junction Companies amalgamated in 1847 under the latter title, which was shortened to the plain Birkenhead Railway Company in 1859.

Extensions of the system in the north such as this were, however, of comparatively little value while it remained impossible to send a truck of goods through to

London over the Company's line. There was no longer the remotest prospect of the Board of Trade being induced to report that "it would be for the advantage of the public" that the Broad Gauge should be extended northward from Wolverhampton—the condition precedent to any application to Parliament for the purpose laid down by the Amalgamation Act of 1854. The only alternative, therefore, was to extend the Narrow Gauge from Reading to Paddington. Another event helped to force this uncongenial task on the reluctant Directors. Saunders explained the position in their Report of August 1860 as follows:

The Amalgamation of the Oxford, Worcester & Wolverhampton Railway with the Worcester & Hereford and the Newport & Abergavenny Railway Companies, under the title of the West Midland Railway, has been a subject of much consideration by your Directors, holding, as the Company does, so large a stake in the ordinary capital of the former Company, besides being deeply interested in the traffic of the District.

The Directors felt bound to resist that Amalgamation, until they were assured by the Chairman of the Oxford, Worcester & Wolverhampton Company that, by laying down the Narrow Gauge on the Great Western Line between Reading and London, great good would result to both Companies; and that, in his opinion, it would be difficult to overestimate the amount of traffic which would flow off the Oxford and Worcester Lines from South Wales for London, when the Worcester and Hereford link shall be completed.

Facility clauses for the interchange of traffic were subsequently introduced into the West Midland Amalgamation Bill, and it becomes now a matter of importance to consider by what means the extensive traffic which should flow from that source can be best conducted.

The extension of Railways throughout England and Wales on the narrow-gauge system has made it more and more apparent that, for the convenient interchange of traffic, it is desirable that a continuous line of narrow-gauge rails should exist from the North to Brentford and Paddington, instead of ceasing, as they now do, at Reading.

To carry out such arrangements, a large expenditure would

necessarily be incurred, and an application to Parliament required for powers to increase the capital of the Company.

The Directors promised to call a Special Meeting of the Company to decide the question, and to circulate a full report on the subject with estimates of the cost. This report was issued on the 18th October and, as will be seen from the following extract, contains an acknowledgment of the evils of a break of gauge, which were so strongly contested and belittled in 1846.

The Directors have now been furnished with detailed Estimates stating what will be the cost of additional rails upon the Line between Reading and Paddington, including the branches to Windsor and Brentford, and at other stations, which show that the cost of those rails laid down, with all requisite Sidings, Crossings, and Switches, will amount to £225,000; and assuming that a new narrow-gauge traffic is thereby to be acquired, the narrow-gauge Locomotives, Carriages, and Waggons, employed for the conveyance of it, will probably require an outlay of an additional sum of £230,000; so that ultimately the aggregate capital employed under this head, the interest of which should be covered by increased traffic, will be £455,000.

The assurances which your Directors received from the Chairman of the West Midland Company, to which allusion has been made in a previous Report, entitles them to believe that, in the event of the proposed Narrow Gauge being laid down, a large additional traffic would flow over the Great Western system between Oxford and London from the Oxford, Worcester & Wolverhampton and other amalgamated lines, and your Directors naturally rely upon those assurances for obtaining such revenue from that source.

It should not be forgotten also that there are other narrow-gauge lines now in operation, or which may spring into existence in different parts of the country, more or less directly connected with your system, to which this Company should be able to afford, and from which they should be able to obtain, facilities for through traffic, rendered difficult during the present break of gauge.

Evidence has been given by competent Persons connected with the Goods Management of this Company that there exists at present inconvenience, expense, and delay in the Transfer of Goods and Coals from the narrow-gauge Waggons in the North

to broad-gauge Waggon for conveyance to the Metropolis, which tends materially to fetter and restrict such trade over the Great Western Line; and those Witnesses anticipate an accession of narrow-gauge traffic from places beyond Wolverhampton, if the additional rails shall be laid in the manner proposed.

It appears that not only are Goods unavoidably delayed in their transit by the process of shifting, but that the Consignors of certain Goods object to the risk of breakage or injury, and are deterred from using this Railway by the break of gauge. An injury to coals in the removal from one waggon to another, the detention of plant by the employment of two waggons of different gauges for minerals destined for London, and the necessary distribution of coals of different descriptions in a manner which generally precludes the transmission of full loads in each broad-gauge truck, are likewise admitted disadvantages in the conduct of that trade, which could be effectually remedied by the continuation of narrow-gauge rails throughout to the Metropolis.

Faced with these convincing arguments the shareholders at the Special Meeting, which was held on the 29th November, consented to the narrow-gauge rails being extended from Reading to Paddington, Brentford, and Windsor, and authorised the Directors to apply to Parliament for power to raise an additional million of capital for this and various other prospective requirements, some of which, such as the rebuilding of Reading and Birmingham Stations and the doubling of the line between Frome and Yeovil, were not carried out for many years.

The work of laying the additional rails was not begun till the following May, by which time a sensational event had made immediate narrow-gauge access to Paddington even more essential. This was no less than the agreed amalgamation of the Great Western and West Midland Companies.

The story of that Company and of the events leading up to this agreement are fully told in the next chapter. Here it is enough to say that a Bill for a railway from Yarnton to London was deposited for the Session of 1861. Having at first officially denied any connection with the

project, the West Midland Board afterwards openly adopted it with Teutonic disregard of their existing treaty with the Great Western, which provided that neither Company should promote or assist any new line competing with the other. This unscrupulous attack seems to have had the desired effect of thoroughly frightening the Great Western Directors. Notwithstanding that they had the London & North Western as allies in the coming fight, they at last decided to buy off the enemy, and did so on the very eve of the battle by agreeing to an amalgamation on terms distinctly favourable to the West Midland Company— $17\frac{1}{2}$ per cent. of the net revenue of the united systems. That the latter got the best of the bargain is shown by the fact that as soon as it came into force West Midland ordinary stock began to pay a dividend, which it had never done before, and continued to do so during the remaining nine years of its distinct existence, while on the other hand the Great Western dividend did not again reach the $3\frac{1}{4}$ per cent. of 1860 until the end of that period. This surrender to what he—probably rightly—regarded as a renewal of an old twice-defeated attempt to extort blackmail was entirely against all Saunders' feelings and prejudices, but he concurred in it because he was unwillingly convinced that the amalgamation was necessary for the future development and ultimate prosperity of the Great Western.

The Agreement was sanctioned by the Great Western shareholders at a Special Meeting on the 30th May, and came into force, so far as it lawfully could without an Act of Parliament, on the 1st July 1861, from which day the two systems were, as far as was practicable, worked as one under the management of a Joint Committee consisting of the eighteen Great Western Directors with the addition of six representatives of the West Midland Board.

Meantime good progress was being made with the narrow-gauge rails towards Paddington, which of course had to be laid without interfering with the traffic. In his Half-yearly Report of the 12th August Lane wrote :

The Mixed Gauge between Reading and Paddington, and between Southall and Brentford, was commenced in May, and is now very nearly complete on the Main Lines, and will certainly be ready for traffic in a few weeks. The remaining portions yet to execute consist of sidings at all intermediate stations, and the Paddington Engine and Goods Sidings, where from the frequent arrivals and departures, and the reforming Goods Trains, the difficulties of construction will unavoidably be much increased. The time required to complete those portions and the Windsor Branch will occupy from four to six months. The total expenditure, notwithstanding the rapid progress of the work, will be within the Estimate.

The main lines must indeed have been very nearly complete, for in the early morning of the second day after writing this Report, Lane and the District Engineer, G. D. Beynon, were able to make an inspection trip throughout on a narrow-gauge engine. They left Reading at 4.30 a.m. and travelling very slowly with frequent stops reached Paddington Platform at 8. Thus on the 14th August 1861 did the first narrow-gauge engine enter the citadel of the broad-gauge stronghold, two days before the Half-yearly Meeting of the Proprietors, to whom Lord Shelburne announced this ominous event.

A narrow-gauge passenger service was inaugurated on the 1st October in the shape of three through trains to and from the Northern and West Midland Lines, the first leaving Paddington for Birkenhead at 9.35 a.m. on that day.

To obviate additional rails through the complicated station at Reading narrow wooden platforms were

erected on either side of the main line outside it, at which these trains stopped. At Didcot also there were no narrow-gauge rails through the station, so all such trains had to run through the Avoiding Line.¹ Although the siding accommodation was far from complete, narrow-gauge goods trains began running to and from Paddington and Brentford at the same time. On the Brentford Branch, a double line, only one road was mixed, and henceforth for many years the branch was worked as two single lines, one for the broad-gauge passenger trains, the other for goods trains of both gauges.

The Windsor Branch, with the Queen's Curve² at Slough, was not ready for narrow-gauge trains until the spring of 1862. Her Majesty travelled over the new rails in April on her way to Scotland.

This completion of narrow-gauge rails to Paddington gave the Great Western not only through access to Birkenhead and Manchester, but also by the West Midland through Worcester and Hereford an alternative route to much of South Wales, which, though somewhat roundabout, was capable of being used as a competing line for goods and mineral traffic with the South Wales Railway. This fact, combined with other matters to be mentioned later, led the Great Western Board to offer to unite with the South Wales Company also. The proposal was eventually accepted, and terms of amalgamation were agreed upon in November.

The existing Agreement or so-called Lease of 1851, under which the Great Western supplied locomotive power to the South Wales, was to be cancelled, and

¹ Till June 1863. Reading Station was not mixed till April 1869.

² The western fork; so called because it was used almost exclusively by Royal Trains.

replaced by a lease of the usual kind at a fixed rent of £170,000 a year from the 1st January 1862 until the Great Western and West Midland amalgamation should be sanctioned by Parliament, when this was to be changed into a division of net receipts on the same principle as between those Companies and an amalgamation Act obtained. The South Wales Proprietors were to receive at first 10.7, and from 1868 onwards 10.9, per cent. of the net revenue of the three united Companies, but never less than £170,000 a year, which would ensure them a minimum dividend of $3\frac{1}{4}$ per cent.

This treaty having been ratified by the shareholders of all three Companies, the South Wales Railway became for all practical purposes part of the Great Western on the 1st January 1862, and four Directors joined the Committee of Management, increasing its number to twenty-eight.

Another railway taken over at this time in consequence of the West Midland amalgamation and the alternative route to Hereford thereby obtained, was the Hereford, Ross & Gloucester, but, as this had been leased to the Great Western from its opening, the effect of its absorption was purely financial.

The same eventful amalgamation also led to the joint acquisition of the Shrewsbury & Hereford Railway by the Great Western and London & North Western Companies. This was a narrow-gauge line $50\frac{1}{2}$ miles long, promoted by much the same people as the Shrewsbury & Chester and sanctioned by Parliament in 1846, in preference to a broad-gauge line from the Monmouth & Hereford Railway to Shrewsbury laid out by Brunel. Its Engineer was Henry Robertson. Owing to the general financial troubles no serious beginning was made till the end of 1850, when the famous Thomas Brassey

took a contract to make the line, and offered to work it at his own risk, paying $3\frac{1}{2}$ per cent. on the cost. His offer was accepted and afterwards changed into a lease for nine years from the 1st July 1853, during the last four years of which he was to pay the Company 4 per cent. and half surplus profits. The railway was opened as a single line from Shrewsbury to Ludlow, $27\frac{1}{2}$ miles, on the 20th April 1852, and throughout to Hereford, Barrs Court, on the 6th December 1853. So successful was Mr. Brassey that by 1860 he was handing over to the Company enough to enable them to pay dividends of 6 per cent. on the ordinary shares. In that year the Company opposed the formation of the West Midland Company, and as a result obtained running powers over the whole of the Newport, Abergavenny & Hereford in return for similar powers to the West Midland over the Shrewsbury & Hereford for traffic to and from the Newport Line.

The news of the Great Western and West Midland agreement fell like a bombshell into the peaceful existence of the Shrewsbury & Hereford Directors. The Great Western, with whom they had hitherto been on friendly terms, was already at both ends of their line, and the West Midland, whom they had frequently had occasion to oppose in Parliament, was about to open the Worcester & Hereford and Severn Valley lines, both of which, they feared, might be used to divert traffic. Moreover, Brassey's lease had little more than a year to run, and then they would have to purchase rolling stock and fend for themselves.

Disturbed by the prospect, they at once approached the London & North Western Board, and the latter, without much loss of time, offered to take a perpetual lease of

the Shrewsbury & Hereford on terms which would guarantee 6 per cent. to the ordinary shareholders, but proposed for politic reasons that the Great Western should be invited to join with them in the lease. This proposal was forthwith communicated to the Great Western Board before the end of May 1861, and again more formally in August, but no definite reply was made till the 13th December, when Saunders wrote that the Great Western and West Midland Joint Committee entertained "so decided an objection that the Shrewsbury & Hereford Railway should pass from independent parties into the control and management of the London & North Western Company, that they cannot consent to become parties in any way to such a lease as proposed." Their real chief reason for refusing was not so much on account of the Shrewsbury & Hereford itself, over which the North Western had already acquired running powers by agreement, as of the fact that even joint possession of that railway would give the North Western Company its powers of running over the whole of the Newport, Abergavenny & Hereford Line, and so obtaining access to the Monmouthshire, Taff Vale, and other railways in South Wales, for which they had been striving for the last ten years, as well as to the Merthyr, Tredegar & Abergavenny Railway, which they had lately succeeded in snatching out of the jaws of the West Midland.

In view of the Great Western attitude, the Shrewsbury & Hereford and London & North Western Companies jointly promoted a Bill in the session of 1862 to authorise the lease to the latter alone, but reserving power to admit the Great Western to participate on terms to be agreed. Though somewhat disarmed by this reservation the Great Western and West Midland fought the Bill fiercely

for six days before the Commons Committee, but without success; the Committee would not even cancel the objectionable running powers. So, making the best of a bad job, they withdrew their opposition and agreed to share equally with the North Western in the lease. The Bill then passed, and the Shrewsbury & Hereford Railway became a joint line on the 1st July 1862, half London & North Western and half Great Western and West Midland, for these two were of course not yet legally united. Mr. Brassey's working stock was then purchased by the Shrewsbury & Hereford and handed over to the Lessees, and arrangements were made for doubling the line throughout, except the Dinmore Tunnel (1,056 yards long);¹ it had already been doubled between Shrewsbury and Ludlow. A joint committee of four North Western and four Great Western and West Midland Directors, with an independent Chairman, to be appointed in case of difference by the Board of Trade, took over the management.

To return to the Great Western Railway itself, several extensions of the system were opened in the last few years before the great amalgamation, though none of these was constructed by the Company.

Of broad-gauge lines not yet mentioned the first was the branch from Hatton to Stratford, opened on the 10th October 1860. This was a single line, $9\frac{1}{4}$ miles long, with a third rail for narrow-gauge trains, made by the Stratford-on-Avon Railway Company,² incorporated for the purpose in 1857, and was worked by the Great Western. Its broad-gauge life was very short. The Oxford,

¹ This was duplicated in 1893.

² Absorbed in 1883; £135 Great Western ordinary for £100 Stratford.

Worcester & Wolverhampton had opened their branch from Honeybourne to Stratford in July 1859, and the Stratford Company having made a short connecting link between the two in 1861, through trains, of course narrow-gauge, began to run between Worcester and Leamington in August; then from the 1st January 1863 all regular trains on the branch became narrow-gauge, and though the broad-gauge rail seems to have remained for the next six years it can only have been used, if at all, by occasional excursion trains.

The Ely Valley Railway,¹ a coal line, from Llantrissant on the South Wales was opened for mineral traffic in August 1860 and leased by the Great Western quite irrespectively of the South Wales, though it could only be reached over the latter Railway. It extended about $7\frac{1}{2}$ miles to Tonyrefail, where the Great Western Company acquired the Cilely Colliery for the supply of coal for their engines. Some short extensions were opened in 1862.

Coming nearer home, the East Somerset Company extended their railway from Shepton Mallet to Wells on the 1st March 1862, and the Wycombe Company theirs from Wycombe to Thame on the 1st August, while the Berks & Hants Extension Company² of 1859—not to be confounded with the old Berks & Hants of 1845, which really did enter Hampshire—opened their line from Hungerford to Devizes on the 11th November. All these were broad-gauge single lines worked by the Great Western; the last named had a short tunnel (190 yards) at Devizes.

¹ Absorbed in 1903; £120 Great Western 5 per cent. guaranteed for £100 Ely consolidated.

² Absorbed in 1882; £87 $\frac{1}{2}$ Great Western ordinary for £100 Berks & Hants.

Three short single-line branches were also added to the Northern Division during this period, all constructed by local Companies, and all of course narrow-gauge. These Companies were the Wellington & Severn Junction,¹ Vale of Llangollen,² and Wrexham & Minera;³ particulars of their lines will be found in the chronological list in the Appendix.

In London itself two important railways were opened for traffic early in 1863—the Metropolitan and the West London Extension.

The former was originally sanctioned by Parliament in 1853 as a railway under the New Road between Paddington and King's Cross entitled the North Metropolitan. The Great Western Directors, who had already found that the distance of Paddington Station from the centre of London counteracted to a great extent the attraction of broad-gauge travelling to Birmingham, at once saw the value of such a line to the Company and alluded to it in their August Report of that year. In the autumn they agreed to subscribe £175,000 to the scheme, provided Parliament should sanction extensions, at one end into the City and at the other to join the Great Western in Paddington Yard, and that the new railway should be broad-gauge. An Act of 1854 reincorporated the Company as the Metropolitan pure and simple with a capital of a million, to make a mixed-gauge railway from the Great Western to near the General Post Office, and authorised the Great Western subscription. However, nothing was done for some years. Apart from the war

¹ Absorbed in 1892.

² Absorbed in 1896; £145 Great Western 5 per cent. guaranteed for £100 Vale of Llangollen ordinary.

³ Absorbed in 1871.

and general depression, people did not take kindly to the new idea of travelling underground and would not subscribe money for any such wild enterprise. At last the City Corporation was induced to take an interest in it to the tune of a £200,000 subscription, and by the end of 1859 the whole million had been obtained and the works commenced. An Act was passed this year making Farringdon Street the eastern terminus.

The formation of the junction branch at Paddington was at once put in hand to provide for the removal of spoil and conveyance of materials, and was practically completed by August 1860. About this same time the Corporation got powers to establish a new central Meat Market at Smithfield, and the Great Western joined the Metropolitan in leasing the basement under the Market for a goods station. In November 1861 the Great Western Directors agreed to work the line, providing locomotive power and rolling stock; and Gooch at once set about designing engines which would consume their own smoke, while eight-wheeled carriages were specially ordered for the new service, which was expected to begin in the following summer. It did not begin, however, till the 10th January 1863, when the Metropolitan Railway was opened from the new station alongside Paddington, entitled Bishop's Road, to Farringdon Street, not quite four miles, and worked by the Great Western with their new broad-gauge condensing engines and eight-wheeled carriages, which latter were lighted with gas, an entirely new departure, and carried twelve second- or third-class passengers in each compartment.

Very soon the two Companies began to quarrel, the first bone of contention being the refusal of the Metropolitan

to allot any of its new stock, to be raised for the extension to Moorgate Street, to the Great Western in respect of their holding of the original stock, on the ground that they had no statutory power to subscribe more than they had already done. As the new stock was selling at a premium the Great Western Directors felt much aggrieved at being deprived of this opportunity of



BROAD-GAUGE TRAIN ON THE METROPOLITAN RAILWAY

making a little money for the Company and went to law on the subject, but without success. Then sundry disputes as to the working arose, the Metropolitan desiring more frequent trains than the four per hour, which Saunders with his somewhat old-fashioned notions considered the limit of safety although the line was worked by Block Telegraph. The Great Western officers on their part seem to have thought the Company were going to lose money by the working. The result was that the Great Western Board gave notice on the 18th July that

they would cease to work the railway at the end of September.

Nothing daunted, the Metropolitan replied they would take it over on the 1st October, whereupon Saunders wrote that the Great Western stock would be withdrawn on the 10th August. If, as appears to have been the case, the Directors thought this ultimatum would bring the Metropolitan people to their knees, they were sadly mistaken, for on the morning of the 11th that Company was ready to carry on with narrow-gauge trains borrowed from the Great Northern, and did so. For this it was indebted to an old Great Western man, Archibald Sturrock, the first Manager of Swindon Works and since 1850 Locomotive Superintendent of the Great Northern Railway, who quickly fitted some of his engines with condensing apparatus for the underground working. Henceforth the Metropolitan worked its own traffic with narrow-gauge stock, but as soon as the differences between the Companies had been composed in the autumn the Great Western began to run some through broad-gauge trains between Windsor and Farringdon Street, and later on worked a broad-gauge service on the Hammersmith line for a short time and then between Addison Road and the City, so the big coaches were not yet entirely banished from the line, for which their great carrying capacity was so eminently suited.

The other new London railway was the West London Extension from the old West London Railway at Kensington over the Thames to join the Victoria Station & Pimlico Railway at Battersea, the West End of London & Crystal Palace Line of the London, Brighton & South Coast Company at Clapham Junction, and the London & South Western at the same place and also by an eastward fork in the direction of Waterloo.

The West London Railway¹ was leased to the London & North Western and Great Western Railways jointly for 999 years in March 1845. Two years later the Great Western had designs of extending it across the River to join the South Western near Vauxhall and obtained an Act for the purpose, but the project perished in the general collapse of 1848-9, and the West London Line was left entirely in the hands of the North Western, who used it for a considerable coal traffic to Shepherd's Bush and Warwick Road Basin, Kensington.

As we have seen, the line from Willesden Junction crossed the Great Western on the level near Wormwood Scrubbs, not quite $2\frac{1}{2}$ miles from Paddington, immediately after passing under the Grand Junction Canal and at the foot of a steep incline. The crossing was therefore distinctly awkward, not to say dangerous. It was protected on the West London Line, in addition to Home and Distant signals in each direction, by heavy wooden barriers on each side of the Great Western, which were raised by ropes and pulleys to let the North Western trains pass, and also on the north by a catch siding on the single line half-way down the incline from Willesden. On the Great Western there were Up and Down signals at the crossing and an Up Distant half a mile to the west, to which another Distant signal in Acton Cutting was added in 1854 worked by a signalman stationed a mile from the crossing, who was expected to repeat the signal shown there, though the latter was only visible in clear daylight and he had no means of communication. Neither of these Distant signals was provided with a lamp, apparently because the crossing was only used between 6 in the morning and 6.15 at night. Hence it is not

¹ See pages 193-5.

surprising that a collision occurred one dark morning at the end of November 1855 between a goods train¹ from Bristol and a North Western coal train in the act of crossing, whereby the guard of the latter was killed and the Great Western guard very severely injured. This accident caused the Directors of the two Companies to decide to divert the West London Railway over the Great Western and abolish the crossing, but for some reason nothing was done for three years, when work was at last begun in anticipation of Parliamentary powers obtained in 1859. The diversion was completed and the crossing abolished in October 1860.

In the same session of 1859 the West London Extension Railway Company was incorporated for the purposes already stated, the Great Western and North Western each subscribing a third of its capital of £300,000, and the South Western and the London, Brighton & South Coast each a sixth. Soon after this the Great Western Directors took steps to acquire a new London terminus in Westminster, from which they seem to have expected great things, by joining with the London, Chatham & Dover Company in a lease of half the new station which the Victoria Station & Pimlico Company was constructing at the west end of Victoria Street, together with the use of the latter's railway from the end of the West London Extension at Longhedge Junction, Battersea. Broad-gauge rails for Great Western trains were laid at

¹ It is interesting to note that this train consisted of 68 waggons with the only guard's van in front next the second engine, and that from Twyford to Southall it had conveyed no less than 90 loaded waggons! The North Western train was actually being *propelled* by an engine behind, the guard's van leading! There were no means of running round on the West London.

that Company's expense throughout from Kensington into Victoria Station, and at the same time steps were taken to double the mixed-gauge single line of the old West London Railway and to connect it with the Great Western main line westward at the point near Wormwood Scrubbs long known as West London Junction.¹ This was completed in the summer of 1862 but not used for Great Western passenger traffic till the bridge over the Thames at Chelsea had been finished. Then, on the 1st April 1863, a service of trains, some broad-some narrow-gauge, was inaugurated between Victoria and Southall, where, or at Ealing, they connected with main line trains. As this service became wholly narrow-gauge in little more than three years time—by October 1866—it would seem that the broad-gauge extension across the Thames, involving as it did the extra width of two long bridges, was in the circumstances a useless expense, which would probably never have been incurred had the work been begun even one year later than it was. As far as Chelsea Basin one or two broad-gauge coal trains continued to run daily for more than ten years, and excursion trains from the west occasionally landed their passengers at Kensington (Addison Road) Station, which in its early days consisted of one long platform on the east side of the line.

These were the last extensions of the old Great Western system prior to the completion of its amalgamation with the West Midland and South Wales to form what was in many ways a new Great Western, nearly half narrow-gauge.

A fight with the London & South Western Company in 1862 remains to be chronicled. For a long time certain

¹ Now Old Oak Common East Box.

people at Southampton had been agitating for a connection with the broad-gauge system, first at Basingstoke and later at Salisbury, and various ineffectual attempts had been made to form companies for the purpose. Although Russell had threatened reprisals for the breach by the South Western of the 1845 Agreement, nothing was done till 1856, when a line from Salisbury through Romsey and Redbridge to Southampton was surveyed by Brunel, only to be dropped.

In 1858 a local company was incorporated, without Great Western support, to make a railway from Andover to Redbridge, chiefly by the conversion of the existing Andover Canal. This was intended to be broad-gauge, but the gauge was left to depend on a connection being sanctioned with the Great Western. The first sod was cut by Lord Palmerston on the 20th September 1859, and construction began in a rather half-hearted fashion. Two years later the Great Western was induced to take up the project, and Bills were promoted in the 1862 Session for broad- or mixed-gauge railways from Enborne, just west of Newbury, to Andover, and from Redbridge to the Royal Pier in Southampton, and also to sanction an agreed lease of the Andover & Redbridge Railway to the Great Western.

The South Western met this assault on their preserves with a Bill for a lease of the Andover & Redbridge to themselves; and counter-attacked with one for a narrow-gauge railway 40 miles long, entitled the Bristol & South Western Junction, from Buckhorn Weston, between Gillingham and Templecombe on the Salisbury & Yeovil Line, through Wincanton and Shepton Mallet and over the Mendip Hills to Bristol.

After a thirty-eight days' fight before the Commons

Committee all these Bills were thrown out, together with a Great Western one for a branch from Keynsham to the Radstock collieries. Another Bill, promoted locally with Great Western assistance, for a railway in Bristol from Temple Meads to a central station under Brandon Hill with connections to the Docks, was also rejected in this same session.

The result of this Parliamentary battle was a peace treaty made on the 23rd October 1862 between the Great Western and South Western Companies, whereby the former relinquished the Andover & Redbridge Railway to the latter, and each Company bound itself not to promote or assist any new line in the other's district, such districts being defined by a map, and agreed to afford various facilities for through traffic. The South Devon Company was invited to join in the treaty and did so, its territory also being defined and provision made for through rates and fares with the South Western.

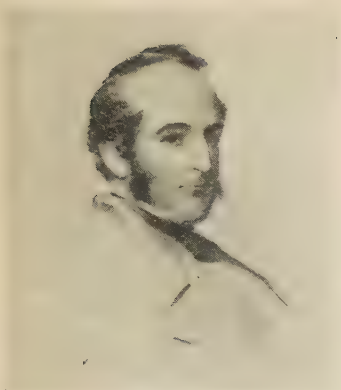
Soon after this the Bills for the amalgamation of the West Midland and South Wales Companies with the Great Western were deposited for the forthcoming Session of 1863. They were opposed by the London & North Western, Midland, Vale of Neath, and Taff Vale, as well as by the various little Companies which later on combined to form the Cambrian, and several others in Wales and its borderland, such as the Brecon & Merthyr and Hereford, Hay & Brecon. The first four were pacified by Agreements scheduled to the Bills, providing for mutual facilities and dealing satisfactorily with all matters at issue between them and the enlarged Great Western. These important Agreements, of which those with the North Western and Midland remain in force at the present time, were ably negotiated by James Grierson,

the Chief Goods Manager. The principal opposition being thus got rid of, the two Bills had a comparatively easy passage through Parliament, the smaller opponents having to be content with provisions for through fares and rates, and received the Royal Assent on the 13th and 21st July respectively, to come into force on the 1st August 1863.

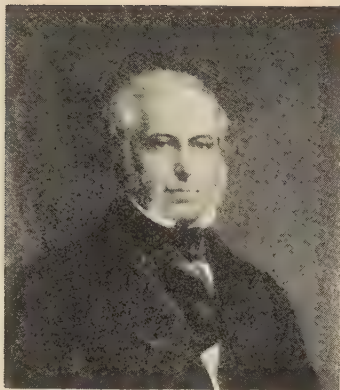
In the meantime changes had been made in the Great Western Board. Lord Shelburne succeeded his father as Marquis of Lansdowne on the 31st January 1863 and was unable to preside at the February Meeting, though he signed the Directors' Report with his new title. The Chair at the Meeting was taken by Ponsonby the Peacemaker, who failed on this occasion to pacify the opposition. The latter was present in force and succeeded in carrying several resolutions limiting the powers of the Board in certain respects, and providing for its reconstruction by a shareholders' election of the Great Western members of the new Board of the amalgamated Company. A committee of seven shareholders was appointed to arrange with the Directors as to the best method of carrying out the resolutions, and the Meeting adjourned for a month to receive their report.

In the interval Lord Lansdowne resigned, and Spencer Walpole consented once again to act as a stop-gap Chairman till the Amalgamation.

At the adjourned Meeting the Committee reported, amongst other things, that the reconstruction of the Board was to be carried out by a clause in the Amalgamation Bill, by which the election of the Great Western contingent on the new Board would be vested in the shareholders, and that in the meantime the present Board had agreed to make vacancies for six new Directors



SPENCER H. WALPOLE



LORD BARRINGTON



LORD SHELBURNE

CHAIRMEN, 1855-1863¹

¹ No portrait of F. G. B. Ponsonby between the extremes of youth and old age seems to exist.

and to fill them up with an equal number to be selected by the Committee and approved by the Board.

Among those who made way for the new-comers were the last two survivors of the original Board of 1835, E. W. Mills of London and H. Simonds of Reading, Lord Barrington, who had been Deputy Chairman for twenty years save for a short interval in the Chair, and Lord Lansdowne, Chairman for the last four years. Notable new Directors were Richard Potter, who had resigned his seat in 1856 and was now a Director of the West Midland, and Alexander Wood, destined to be Deputy Chairman for well-nigh a quarter of a century.

The Amalgamation Acts having passed, a Special Meeting of the old Great Western shareholders was held on the 7th August to elect seventeen Directors—Sir Watkin Wynn's right to nominate one having been preserved by the Act—to represent them on the new Board of twenty-eight. The eleven old and six new Directors in office were duly nominated but opposed by candidates put up by a recalcitrant minority of the opposition, whose spokesman demanded a poll on every name. This caused the Meeting to be adjourned to the 10th and then to the 13th August, when at last the existing Directors were declared elected by large majorities. Not one of them it may be noted, had been on the Board in the "fighting 'forties."

A still greater break with the past was the retirement of the man who had done so much to nurse the Great Western Railway into life originally and to guide and foster its growth and development for thirty years, Charles Saunders, the first servant of the Company and later its chief executive officer. In the summer of 1862 Saunders, now aged nearly sixty-six, began to feel the first symptoms

of heart trouble, caused by overwork and doubtless also by distress due to the embarrassed state of the Company's finances. A holiday brought temporary relief, but in December medical advice decided him to inform the Board of his wish to resign. The Directors, however, begged him to remain in office at any rate till the end of the forthcoming session of Parliament, on the distinct understanding that he was to take things easily and not work as he had done. They promised then to secure him "such retiring pension as his long and highly valued services, to which in fact he may be said to have sacrificed his health, fully entitle him to expect"; and the Chairman was requested, with the help of his predecessors, Walpole and Barrington, to draft a paragraph for the February Report. It was as follows:

The Directors regret to add that it has now become their painful duty to announce to the Shareholders that their old and much valued Secretary and General Superintendent has been constrained by the state of his health and advancing years to tender his resignation. Instead, however, of accepting that resignation it has seemed to them to be a matter of so much importance that the Company should have the benefit of his knowledge and experience in assisting them to pass the Amalgamation Bill through Parliament that they have requested him to continue his services for a limited period.

To this Mr. Saunders has consented. In the meanwhile the Directors feel that, after thirty years of unwearied labour and conspicuous ability, they ought not to part with one who has given them the best years of his life without recommending to the Shareholders that such a retiring pension should be granted to him as his long and faithful services fully entitle him to expect.

Although it was not to be decided at the Meeting, this hitherto unheard of proposal of a pension to a retiring officer provoked some protests. Moreover, a small but noisy section of the opposition, mostly from Bristol and its neighbourhood, was animated by personal hostility

to Saunders, whom they regarded as the originator of the costly extensions to the north. The Great Western Railway, in their opinion, should have remained confined to its original purpose—of serving the City of Bristol and perhaps South Wales, certainly not Birmingham, much less the rival port on the Mersey.

Saunders therefore remained in office to see the Amalgamation Bills safely through Parliament and was the chief witness for them before the Committees, but most of the arrangements, such as the agreements with other Companies, were left, subject to his general supervision, to his able young coadjutor, James Grierson, aided by A. C. Sherriff, the General Manager of the West Midland.

The first Meeting of the united Company in September was the scene of a painful display of spite on the part of the hostile clique against the old man who had worn himself out in the service of the Great Western and was now made the scapegoat for its lack of prosperity. He was warmly defended by, amongst others, Lord Lansdowne and Ponsonby, who as ex-Chairmen bore witness that he had never been an advocate for extensions in general, and that his advice had been by no means always followed by the Board. When it came to voting, his enemies made a very poor show, and a modest pension of less than half his salary, proposed by the Directors, was carried by a large majority of the shareholders present. He did not live long to enjoy a well-earned rest. His resignation took effect at the end of the month, but he never recovered his health and died at Westbourne Lodge on the 19th September 1864, just a year and a day after the Meeting.

How far Saunders was responsible for Great Western policy during his long term of office it is now impossible to say. As regards the extension to the north, it seems

that after the defection of the Grand Junction Company in 1845 he doubted the wisdom of going on with the Birmingham & Oxford and Birmingham, Wolverhampton & Dudley projects, but the Board having decided on it he loyally accepted their decision, as he always did, and carried the great fight to victory, thereby making many bitter enemies. The subsequent acquisition of the Shrewsbury Railways he appears to have favoured, recognising their value as feeders for the line to Wolverhampton, though it is doubtful whether he approved of the costly guarantee eventually given to the two Companies.

Of Brunel and the Broad Gauge he was always an out-and-out supporter, and the weight which he soon acquired and held as a witness before Parliamentary Committees contributed largely to the victories of the Great Western over their Narrow Gauge opponents in the days of the Gauge War and afterwards. He remained a Broad Gauge man to the last, though he must have recognised that its ultimate extinction was only a matter of time.

In dealings with other Companies Saunders is said to have been in his later days somewhat cautious and difficult, and this was one of the accusations brought against him by the two Directors who resigned in 1856. His old adversary, Captain Huish, giving evidence before the Commons Committee on the South Wales Railway Bill of 1861, said: "I do not know of any Company so difficult to come to an agreement with as the Great Western, or one which keeps so honourably to an agreement when once made."

Though he was the chief executive officer of the Company with the title of General Superintendent, his



CHARLES ALEXANDER SAUNDERS (c. 1850)

position was not quite that of a General Manager because during all his time the Directors themselves took cognisance of and decided the most trifling details of management. Hence it is uncertain whether on any given occasion Saunders was acting independently or merely as the mouthpiece of the Board. Matters for which he must be given credit were the original organisation and training of the staff, other than that of the Engineering and Locomotive Departments, and the general administration of the Company's business at a time when there was little or no experience to guide him. According to his successor, Grierson, he was specially insistent on two points—harmonious working between the officers of the various departments, and that unfailing courtesy to the public for which the Great Western staff has always been distinguished. No less than five General Managers of other railways were trained under Saunders at Paddington—Seymour Clarke of the Great Northern, W. O'Brien of the North Eastern, R. Underdown of the Manchester, Sheffield & Lincolnshire, J. S. Forbes of the London, Chatham & Dover, and P. Morris of the North Staffordshire.

Gooch wrote of his death:¹

On September the 22nd,² 1864, my old and good friend Mr. Saunders died. He was one of the most able of our railway men, and in his time had probably had a greater amount of influence than any other. He was a perfect gentleman and much liked by all the officers. We presented him with a very handsome testimonial in January. We had worked together for nearly my whole life and never had a disagreement. He was always a good friend to his brother officers and a man of high honour.

The testimonial alluded to was subscribed by 180 of the Directors, officers, station masters, and principal clerks,

¹ *Diaries of Sir Daniel Gooch*, p. 84.

² This date is a mistake; probably it is that of the funeral.

and took the form of a valedictory address and a dressing case for Mrs. Saunders containing the balance of the £575 collected.

In November Saunders had received from Queen Victoria a handsome silver centrepiece “as a mark of Her Majesty’s approval of your services in attendance on Her Majesty on every occasion for very many years past on which she has travelled on the Great Western Railway.”¹

These tributes must have helped somewhat to soften the old man’s pain at leaving the Company, to whose interests he was so devoted, at a time when its fortunes were at such a low ebb. Altogether the passing of this Great Western pioneer is rather pathetic. He sowed—or at any rate helped to sow—the seed from which his successors in better times were to reap prosperity.

¹ Extract from letter of Sir Charles Phipps, K.C.B., Keeper of the Privy Purse, dated Windsor Castle, 3rd November 1863.

